

PRELIMINARY HYDROLOGIC ANALYSIS

For:

**COMPREHENSIVE PERMIT PLAN
RIVER STONE
HINGHAM, MA**

Located:

**VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS**

Submitted to:
TOWN OF HINGHAM

Prepared For:
**RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061**



Professional Civil Engineering • Project Management • Land Planning
150 Longwater Drive, Suite 101, Norwell, Massachusetts 02061
Tel.: (781) 792-3900 Facsimile: (781) 792-0333
www.mckeng.com

TABLE OF CONTENTS

	<u>Page</u>
1. NARRATIVE	
▪ Project Summary	1
▪ Pre-Development Condition	1
▪ Post-Development Condition	3
▪ Figure 1 (USGS Locus Map)	5
▪ Figure 2 (FEMA Flood Map)	6
▪ Figure 3 (SCS Soils Map)	7
▪ Figure 4 (NHESP Map)	8
2. APPENDICES	
▪ APPENDIX A: Pre-Development Condition	
▪ APPENDIX B: Post Development Condition	
▪ APPENDIX C: Soil Testing	

**Preliminary Hydrologic Analysis
Comprehensive Permit Plan
River Stone
Viking Lane and Ward Street
Hingham, MA**

Project Summary

The project proponent, River Stone, LLC, proposes to develop an approximate 6.67 acre parcel of land on Viking Lane and Ward Street in Hingham, Massachusetts based on the plans entitled "Definitive Subdivision Viking Lane at Ward Street in Hingham, Massachusetts", dated March 20, 1995 recorded in Plan Book 45, Page 803. The proposed development will consist of 32 residential units comprised of 1, 2, 3 and 4-unit buildings. The development is being permitted under MGL Ch. 40B Comprehensive Permit. The proposed development will involve the construction of approximately 1,820 linear feet of bituminous roadway, bituminous parking areas, and associated infrastructure.

The project will access utility infrastructure located on Viking Lane and Ward Street, including water, electric, telephone and cable television. A wastewater collection system will be constructed to convey sewage flows to an on-site wastewater treatment plant and soil absorption system. The stormwater management system will be designed to fully comply with all standards of the Department of Environment Protection's Stormwater Management Regulations and will utilize an existing closed drainage system on Viking Lane and existing stormwater management facility located on-site.

The project is comprised of one parcel which is shown on Assessors' Map 124, Lots 70-75 and Lot 26. The site is bounded by developed residential lots on Ward Street to the south, southwest, and northwest, Autumn Circle to the northeast and to the north. Refer to Figure 1 - USGS Locus Map for the location of the parcel.

The existing and proposed site conditions are illustrated on the project site plans entitled "Comprehensive Permit Plans known as River Stone (Assessors' Map 124, Lots 70-75 and Lot 26), Viking Lane and Ward Street, Hingham, Massachusetts," prepared by McKenzie Engineering Group, Inc. and dated October 7, 2015, revised December 20, 2017 and January 8, 2018. This report contains stormwater peak rate of runoff calculations for the pre-development and post-development conditions and includes the sizing of the proposed drainage systems for compliance with DEP Stormwater Management Standard 2 – Peak Rate Attenuation.

Pre-Development Condition

The site is located within the Residence B Zoning District and is not located in the Aquifer Protection District and the Natural Heritage and Endangered Species. The site is located within the Zone X of the Flood Insurance Rate Map, as shown on the current FEMA Flood Insurance Rate Map Panel No. 25023CO083J with an effective date of July 17, 2012. Refer to Figure 2 – FEMA Flood Map.

The limit of bordering vegetated wetland resource areas and approximate location of the intermittent stream on the site were delineated by Environmental Consulting and Restoration, LLC in June 2015.

The parcel is currently undeveloped and is mostly wooded with some grass areas with the exception of Viking Lane and the stormwater management facility. The topography of the site ranges in elevation from approximately 54 ft. (NAVD 88) in the northeasterly portion of the site to an elevation of approximately 86 ft. along the southerly portion of the site. Portions of runoff emanating from the site flow in a southwesterly and northwesterly direction to the closed drainage system on Viking Lane, southeasterly and northeasterly to the existing stormwater management facility and existing wetlands, with a small portion flowing towards Ward Street to the south and abutting properties to the northwest. The soil types as identified by the Soil Survey, Plymouth County, MA prepared by the NRCS Soil Conservation Service (NRCS) are classified Quonset sandy loam, 8 to 15 percent slopes; Warwick fine sandy loam, 0 to 8 percent slopes; Sudbury fine sandy loam, 3 to 8 percent slopes; and Freetown muck, 0 to 1 percent slopes soils. The soils fall into the following hydrological soil groups: Quonset – HSG A, Warwick – HSG A, Sudbury – HSG B, and Freetown - HSG D. Through an on-site soil evaluation, the site soils were determined to be consistent with the NRCS soil classifications. Refer to Figure 3 - Soil Map for the NRCS delineation of soil types and Appendix C – Soil Testing Results for supporting data.

In the pre- and post- development stormwater analysis, the watershed area analyzed was approximately 7.42 acres consisting of the subject parcel to be developed and offsite tributary areas and consists of five (5) sub-catchments. Refer to Pre-Development Watershed Delineation Plan WS-1 in Appendix A for a delineation of drainage subareas for the pre-development design condition.

The SCS Technical Release 20 (TR-20) and Technical Release 55 (TR-55) method based program “HydroCAD” was employed to develop pre- and post-development peak flows. Drainage calculations were prepared for the pre-development condition for the 2, 10, 25 and 100-year, Type III storm events. Refer to Appendix A for computer results, soil characteristics, cover descriptions and times of concentrations for all subareas.

The peak rates of runoff and elevations for this condition are as follows:

Table 1 – Pre-Development Results				
	Design Storm (flow in cfs)			
	2-Year Storm	10-Year Storm	25-Year Storm	100-Year Storm
Design Point	Flow (CFS)	Flow (CFS)	Flow (CFS)	Flow (CFS)
DP-1	0.56	0.90	1.17	1.69
DP-2	0.00	0.00	0.00	0.01
DP-3	1.18	3.21	4.79	7.15
DP-4	0.00	0.00	0.02	0.09
DP-5	0.02	0.23	0.53	1.27

	Design Storm (volume in ac-ft)			
	2-Year Storm	10-Year Storm	25-Year Storm	100-Year Storm
Design Point	Volume (AC-FT)	Volume (AC-FT)	Volume (AC-FT)	Volume (AC-FT)
DP-1	0.042	0.076	0.110	0.173
DP-2	0.000	0.000	0.001	0.007

DP-3	0.159	0.338	0.496	0.771
DP-4	0.000	0.002	0.007	0.018
DP-5	0.013	0.040	0.082	0.150

Post-Development Condition

The proposed development will consist of 32 residential units comprised of 1, 2, 3 and 4-unit buildings with bituminous concrete access roadways, parking areas, sidewalks and associated infrastructure. Visitor parking will be dispersed throughout the site. Viking Lane will be widened to 20 feet and access will be provided to Autumn Circle through an existing easement.

The project will access utility infrastructure located on Viking Lane and Ward Street, including water, electric, telephone and cable television. A wastewater collection system will be constructed to convey sewage flows to an on-site wastewater treatment plant and soil absorption system. The stormwater management system will be designed to fully comply with all standards of the Department of Environment Protection's Stormwater Management Regulations and will utilize an existing closed drainage system on Viking Lane and existing stormwater management facility located on-site.

In the post-development condition, stormwater analysis watershed areas were analyzed for purposes of designing a drainage system to accommodate the 13 buildings and associated bituminous roadway infrastructure. The objective in designing the proposed drainage facilities for the project was to maintain existing drainage patterns to the extent practicable and to ensure that the post-development rates of runoff are equal or less than pre-development. Refer to Post-Development Watershed Delineation Plan WS-2 in Appendix B for a delineation of post-development drainage subareas. The watershed area and design points for the post-development design conditions correspond to those analyzed for the pre-development design condition and are shown on Plan No. WS-2.

Drainage calculations were prepared by employing the SCS TR-20 Methods for the 2, 10, 25 and 100-year, type III storm events. Refer to Appendix B for computer results. The subsurface infiltration chambers were designed to accommodate peak flows generated by all storms up to and including the 100-year storm event. Refer to site plans for the drainage system design.

Table 2 – Post-Development Results

Design Point	Design Storm (flow in cfs)			
	2-Year Storm	10-Year Storm	25-Year Storm	100-Year Storm
DP-1	0.25	0.49	0.69	1.03
DP-2	0.00	0.00	0.00	0.00
DP-3	1.15	2.12	2.91	5.45
DP-4	0.00	0.00	0.00	0.00
DP-5	0.00	0.05	0.13	0.35

	Design Storm (volume in ac-ft)			
	2-Year Storm	10-Year Storm	25-Year Storm	100-Year Storm
Design Point	Volume (AC-FT)	Volume (AC-FT)	Volume (AC-FT)	Volume (AC-FT)
DP-1	0.020	0.037	0.051	0.075
DP-2	0.000	0.000	0.000	0.000
DP-3	0.091	0.419	0.695	1.150
DP-4	0.000	0.000	0.000	0.000
DP-5	0.003	0.010	0.017	0.033

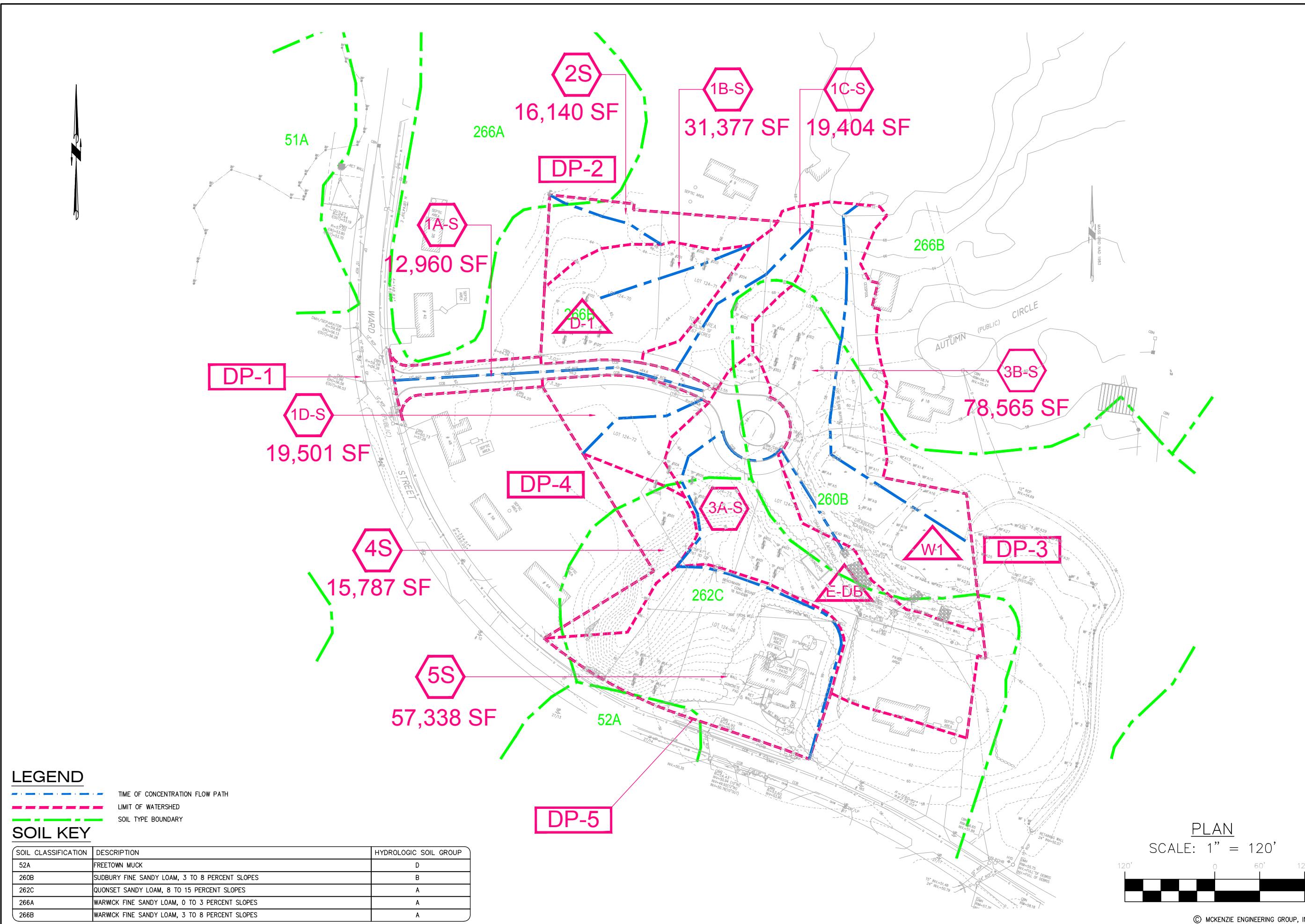
APPENDIX A

Pre-Development Condition

COMPREHENSIVE PERMIT PLAN

KNOWN AS
RIVER STONE
(ASSESSOR'S MAP 124, LOTS 70-75 & LOTS 26)
HINGHAM, MASSACHUSETTS

REV	DATE	DESCRIPTION	BY APP
-----	------	-------------	--------



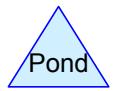
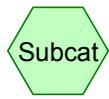
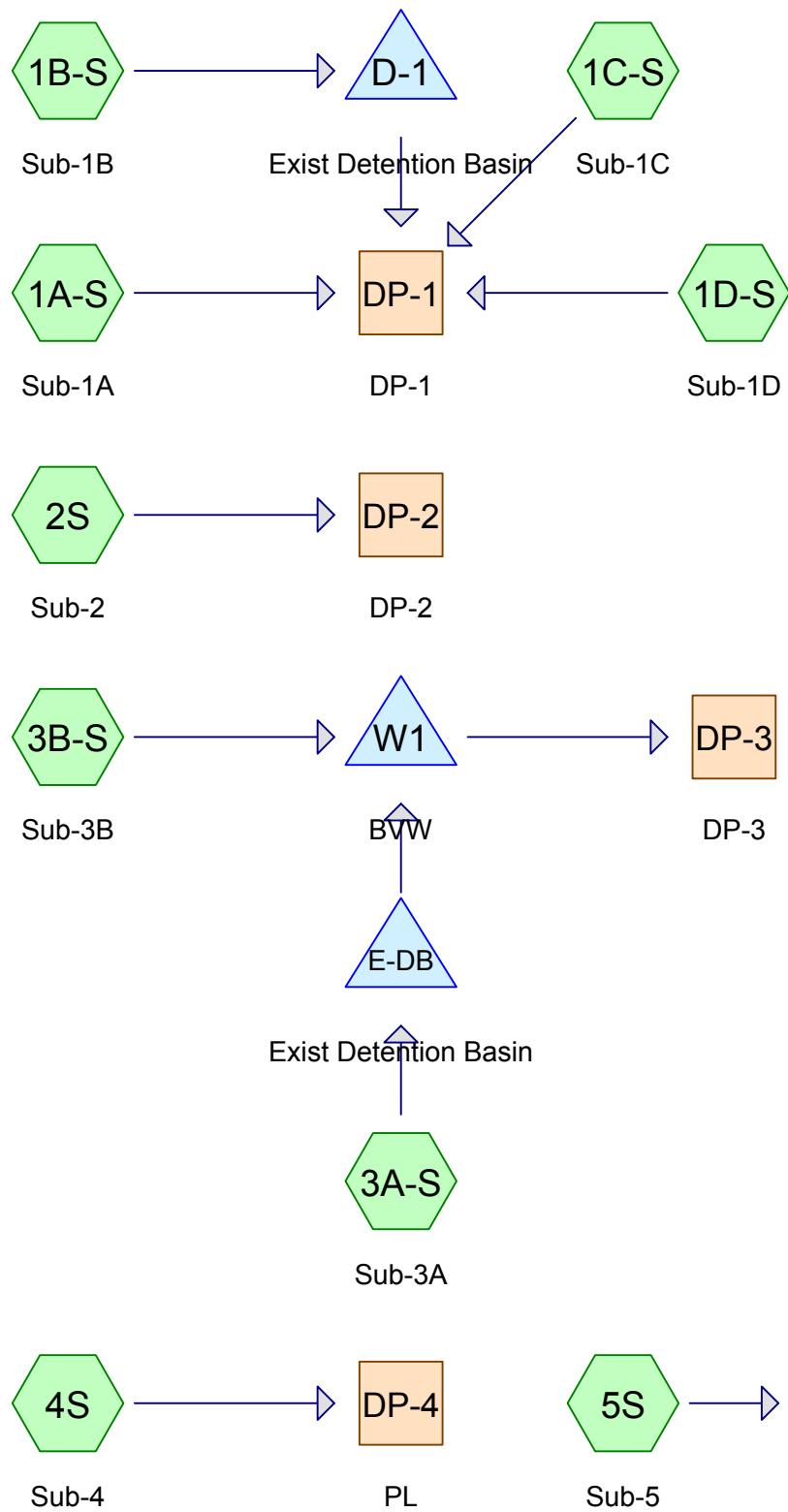
APPLICANT:
RIVER STONE, LLC
299R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

DRAWN BY: SBS
DESIGNED BY: SBS
CHECKED BY: BCM
APPROVED BY: BCM
DATE: JANUARY 8, 2018
SCALE: 1"=120'
PROJECT NO.: 27-135
DWG. TITLE:

Pre-Dev.
Watershed
Plan

DWG. NO:
WS-1

M:\MCK\2007 PROJECTS\27-135\DWGS\CUT SHEETS\SUBMISSION R1\27-135 WS-1 (R1).DWG



Routing Diagram for 27-135 Pre-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

27-135 Pre-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.258	49	50-75% Grass cover, Fair, HSG A (1B-S, 1C-S, 1D-S)
0.976	39	>75% Grass cover, Good, HSG A (1A-S, 1B-S, 1C-S, 1D-S, 3A-S, 3B-S, 5S)
0.116	39	>75% Grass cover, Good, HSG A - offsite (3A-S, 3B-S)
0.338	61	>75% Grass cover, Good, HSG B (3A-S, 3B-S)
0.022	61	>75% Grass cover, Good, HSG B - offsite (3B-S)
0.009	80	>75% Grass cover, Good, HSG D (5S)
0.062	98	Existing Detention Basin, HSG A (3A-S)
0.029	98	Existing Detention Basin, HSG B (3A-S)
0.005	98	Misc, HSG A (5S)
0.012	98	Patio, HSG A (5S)
0.120	98	Paved drive, HSG A (5S)
0.007	98	Paved drive, HSG A - offsite (3B-S)
0.007	98	Paved drive, HSG D (5S)
0.369	98	Paved parking, HSG A - offsite (3A-S)
0.259	98	Paved roads w/curbs & sewers, HSG A (1A-S, 3A-S)
0.075	98	Paved roads w/curbs & sewers, HSG B (3A-S)
0.025	98	Riprap, HSG A (3A-S, 3B-S)
0.024	98	Riprap, HSG B (3A-S, 3B-S)
0.049	98	Roofs, HSG A (5S)
0.032	98	Roofs, HSG A - offsite (3A-S)
0.018	98	Rubble Pile, HSG A (1D-S)
0.363	98	Wetlands, HSG B (3B-S)
0.010	98	Wetlands, HSG B - offsite (3B-S)
1.117	36	Woods, Fair, HSG A (4S, 5S)
2.058	30	Woods, Good, HSG A (1B-S, 1C-S, 1D-S, 2S, 3A-S, 3B-S)
0.158	30	Woods, Good, HSG A - offsite (1C-S, 3A-S, 3B-S)
0.859	55	Woods, Good, HSG B (1C-S, 3A-S, 3B-S)
0.040	55	Woods, Good, HSG B - offsite (3B-S)
7.418	51	TOTAL AREA

27-135 Pre-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 3**Soil Listing (all nodes)**

Area (acres)	Soil Group	Subcatchment Numbers
5.642	HSG A	1A-S, 1B-S, 1C-S, 1D-S, 2S, 3A-S, 3B-S, 4S, 5S
1.759	HSG B	1C-S, 3A-S, 3B-S
0.000	HSG C	
0.016	HSG D	5S
0.000	Other	
7.418		TOTAL AREA

27-135 Pre-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 4

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.258	0.000	0.000	0.000	0.000	0.258	50-75% Grass cover, Fair	1B-S, 1C-S, 1D-S
1.092	0.360	0.000	0.009	0.000	1.461	>75% Grass cover, Good	1A-S, 1B-S, 1C-S, 1D-S, 3A-S, 3B-S, 5S
0.062	0.029	0.000	0.000	0.000	0.092	Existing Detention Basin	3A-S
0.005	0.000	0.000	0.000	0.000	0.005	Misc	5S
0.012	0.000	0.000	0.000	0.000	0.012	Patio	5S
0.127	0.000	0.000	0.007	0.000	0.134	Paved drive	3B-S, 5S
0.369	0.000	0.000	0.000	0.000	0.369	Paved parking	3A-S
0.259	0.075	0.000	0.000	0.000	0.334	Paved roads w/curbs & sewers	1A-S, 3A-S
0.025	0.024	0.000	0.000	0.000	0.049	Riprap	3A-S, 3B-S
0.081	0.000	0.000	0.000	0.000	0.081	Roofs	3A-S, 5S
0.018	0.000	0.000	0.000	0.000	0.018	Rubble Pile	1D-S

27-135 Pre-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 5

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.373	0.000	0.000	0.000	0.373	Wetlands	3B-S
1.117	0.000	0.000	0.000	0.000	1.117	Woods, Fair	4S, 5S
2.216	0.899	0.000	0.000	0.000	3.115	Woods, Good	1B-S, 1C-S, 1D-S, 2S,
							3A-S, 3B-S
5.642	1.759	0.000	0.016	0.000	7.418	TOTAL AREA	

27-135 Pre-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 6**Pipe Listing (all nodes)**

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3A-S	0.00	0.00	157.0	0.0030	0.013	15.0	0.0	0.0
2	E-DB	58.12	58.05	25.0	0.0028	0.013	12.0	0.0	0.0

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1A-S: Sub-1A	Runoff Area=12,960 sf 68.56% Impervious Runoff Depth=1.64" Tc=6.0 min CN=79 Runoff=0.56 cfs 0.041 af
Subcatchment1B-S: Sub-1B	Runoff Area=31,377 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=212' Tc=9.6 min CN=35 Runoff=0.00 cfs 0.000 af
Subcatchment1C-S: Sub-1C	Runoff Area=19,404 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=269' Tc=16.6 min CN=37 Runoff=0.00 cfs 0.000 af
Subcatchment1D-S: Sub-1D	Runoff Area=19,501 sf 3.95% Impervious Runoff Depth=0.02" Flow Length=185' Tc=11.0 min CN=40 Runoff=0.00 cfs 0.001 af
Subcatchment2S: Sub-2	Runoff Area=16,140 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=164' Tc=8.6 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment3A-S: Sub-3A	Runoff Area=72,040 sf 40.04% Impervious Runoff Depth=0.66" Flow Length=534' Tc=9.4 min CN=62 Runoff=0.87 cfs 0.091 af
Subcatchment3B-S: Sub-3B	Runoff Area=78,565 sf 21.55% Impervious Runoff Depth=0.53" Flow Length=552' Tc=12.4 min CN=59 Runoff=0.60 cfs 0.080 af
Subcatchment4S: Sub-4	Runoff Area=15,787 sf 0.00% Impervious Runoff Depth=0.00" Tc=6.0 min CN=36 Runoff=0.00 cfs 0.000 af
Subcatchment5S: Sub-5	Runoff Area=57,338 sf 14.73% Impervious Runoff Depth=0.12" Flow Length=438' Tc=14.0 min CN=46 Runoff=0.02 cfs 0.013 af
Reach DP-1: DP-1	Inflow=0.56 cfs 0.042 af Outflow=0.56 cfs 0.042 af
Reach DP-2: DP-2	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach DP-3: DP-3	Inflow=1.18 cfs 0.159 af Outflow=1.18 cfs 0.159 af
Reach DP-4: PL	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach DP-5: PL	Inflow=0.02 cfs 0.013 af Outflow=0.02 cfs 0.013 af
Pond D-1: Exist Detention Basin	Peak Elev=62.00' Storage=0 cf Inflow=0.00 cfs 0.000 af Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Pond E-DB: Exist Detention Basin	Peak Elev=58.79' Storage=687 cf Inflow=0.87 cfs 0.091 af Outflow=0.62 cfs 0.079 af

27-135 Pre-Development Final (R1-1)*Type III 24-hr 2-Year Rainfall=3.60"*

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 8**Pond W1: BVW**Peak Elev=56.02' Storage=102 cf Inflow=1.16 cfs 0.159 af
Outflow=1.18 cfs 0.159 af**Total Runoff Area = 7.418 ac Runoff Volume = 0.226 af Average Runoff Depth = 0.37"
80.23% Pervious = 5.951 ac 19.77% Impervious = 1.466 ac**

Summary for Subcatchment 1A-S: Sub-1A

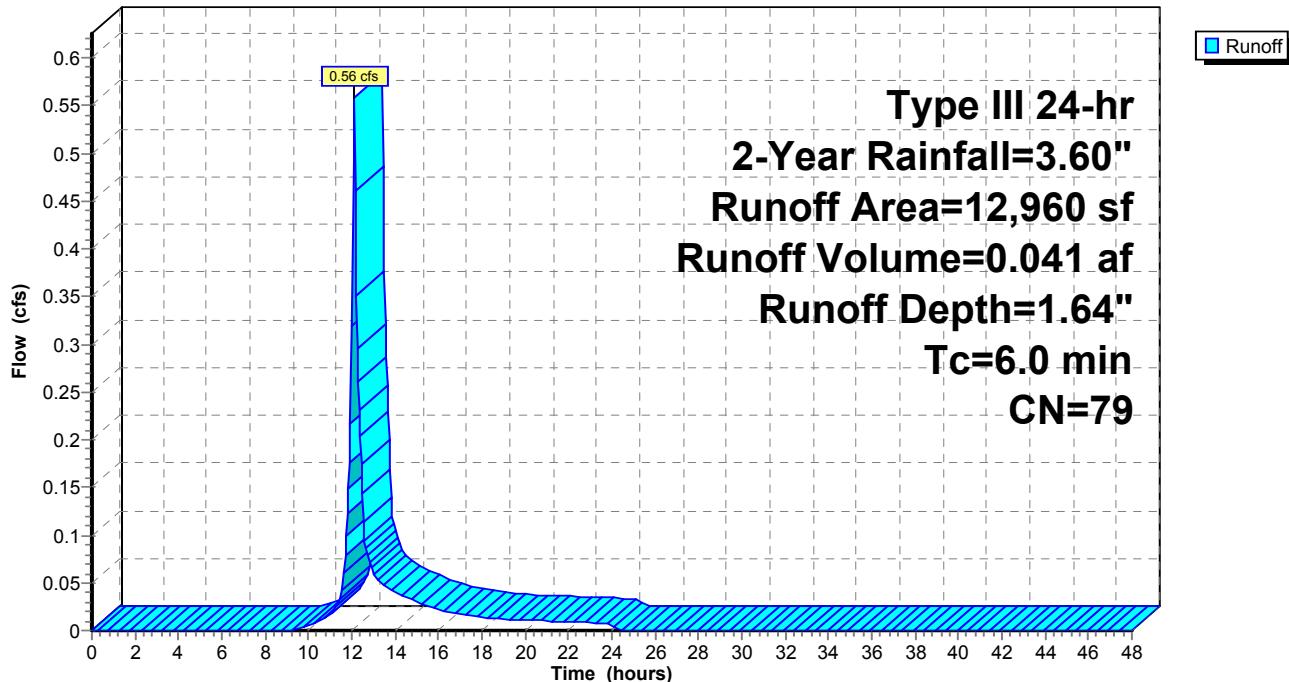
Runoff = 0.56 cfs @ 12.10 hrs, Volume= 0.041 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description			
4,075	39	>75% Grass cover, Good, HSG A			
8,885	98	Paved roads w/curbs & sewers, HSG A			
12,960	79	Weighted Average			
4,075		31.44% Pervious Area			
8,885		68.56% Impervious Area			
Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1A-S: Sub-1A

Hydrograph



Summary for Subcatchment 1B-S: Sub-1B

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

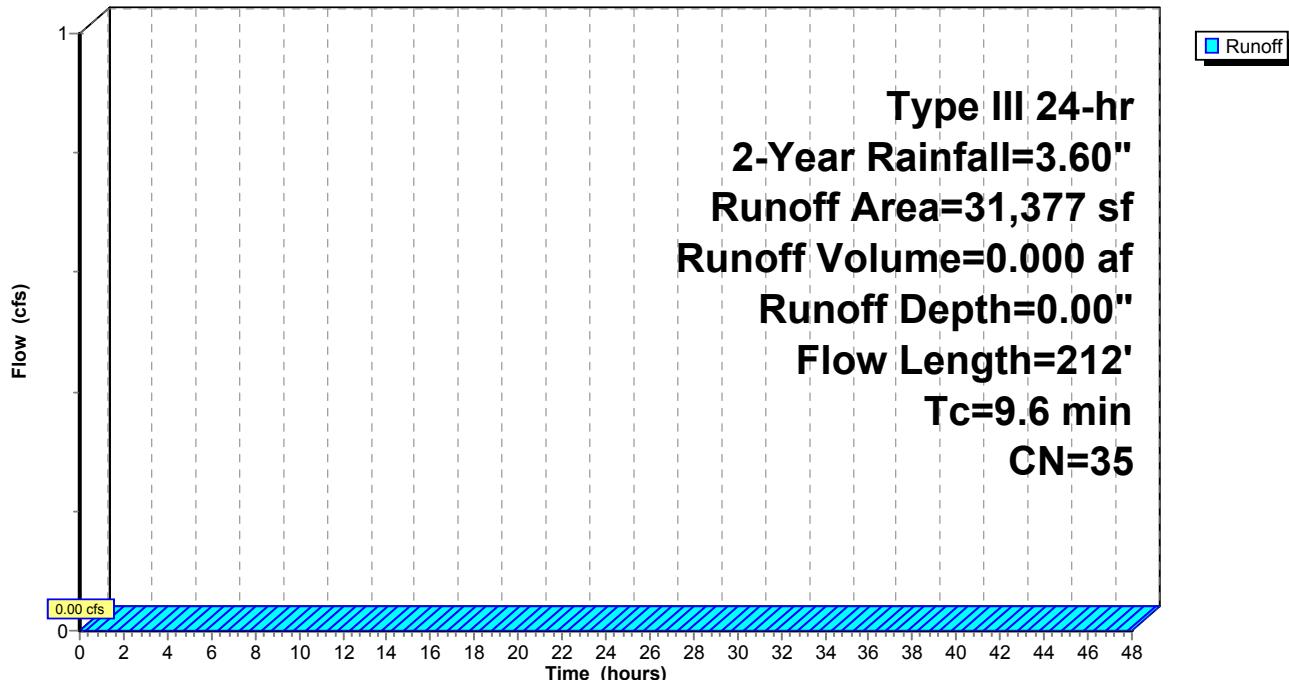
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
22,072	30	Woods, Good, HSG A
1,755	39	>75% Grass cover, Good, HSG A
7,550	49	50-75% Grass cover, Fair, HSG A
31,377	35	Weighted Average
31,377		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.60"
1.5	162	0.0120	1.76		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.6	212	Total			

Subcatchment 1B-S: Sub-1B

Hydrograph



Summary for Subcatchment 1C-S: Sub-1C

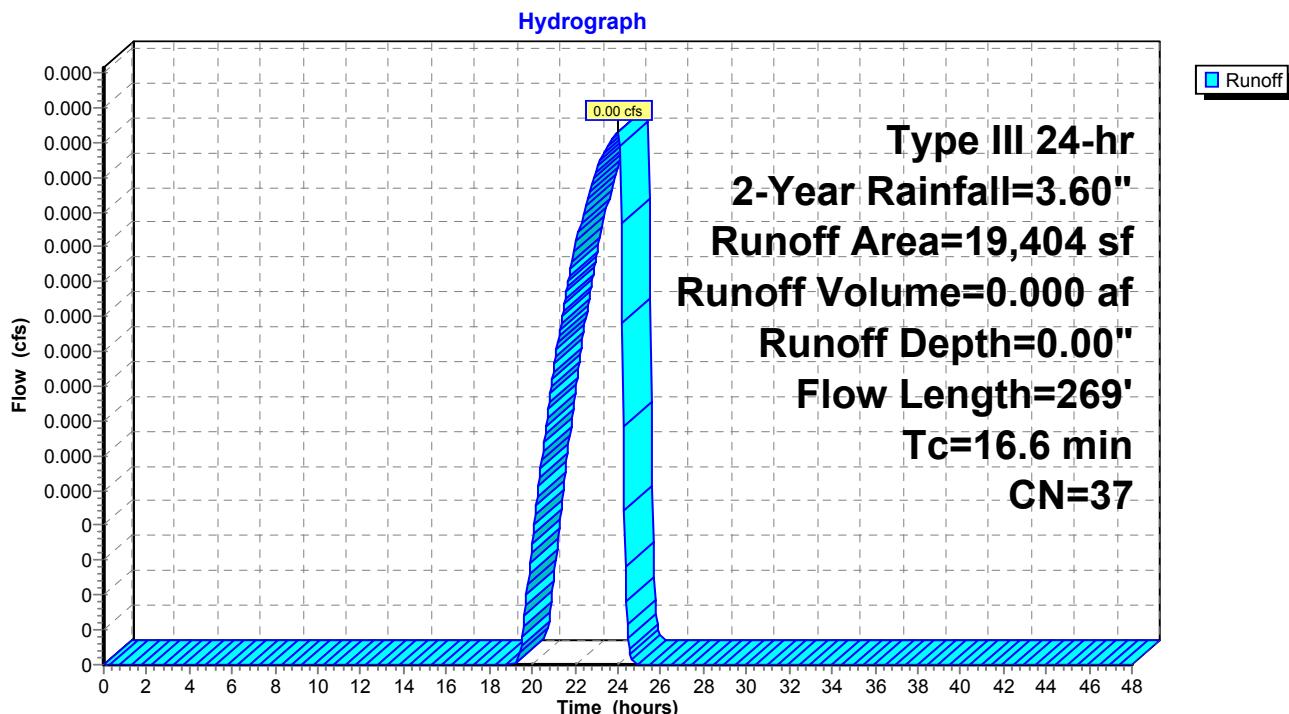
Runoff = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
*	12,129	30 Woods, Good, HSG A
	1,513	>75% Grass cover, Good, HSG A
	3,840	55 Woods, Good, HSG B
	899	30 Woods, Good, HSG A - offsite
	1,023	49 50-75% Grass cover, Fair, HSG A
19,404	37	Weighted Average
19,404		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	50	0.0120	0.06		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
2.3	219	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
16.6	269	Total			

Subcatchment 1C-S: Sub-1C



Summary for Subcatchment 1D-S: Sub-1D

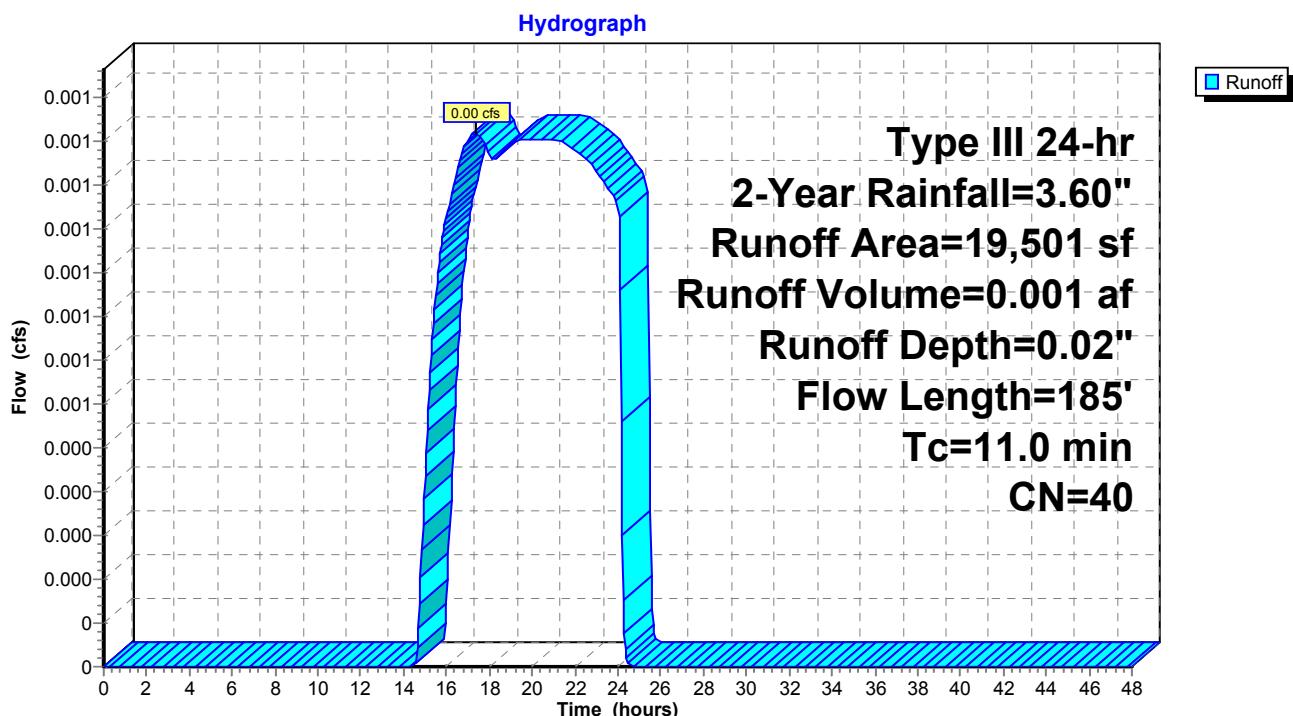
Runoff = 0.00 cfs @ 17.33 hrs, Volume= 0.001 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
10,890	39	>75% Grass cover, Good, HSG A
2,684	49	50-75% Grass cover, Fair, HSG A
*	98	Rubble Pile, HSG A
	30	Woods, Good, HSG A
	40	Weighted Average
		96.05% Pervious Area
5,157		3.95% Impervious Area
19,501		
18,731		
770		

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0300	0.08		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
1.1	135	0.0160	2.04		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
11.0	185	Total			

Subcatchment 1D-S: Sub-1D



Summary for Subcatchment 2S: Sub-2

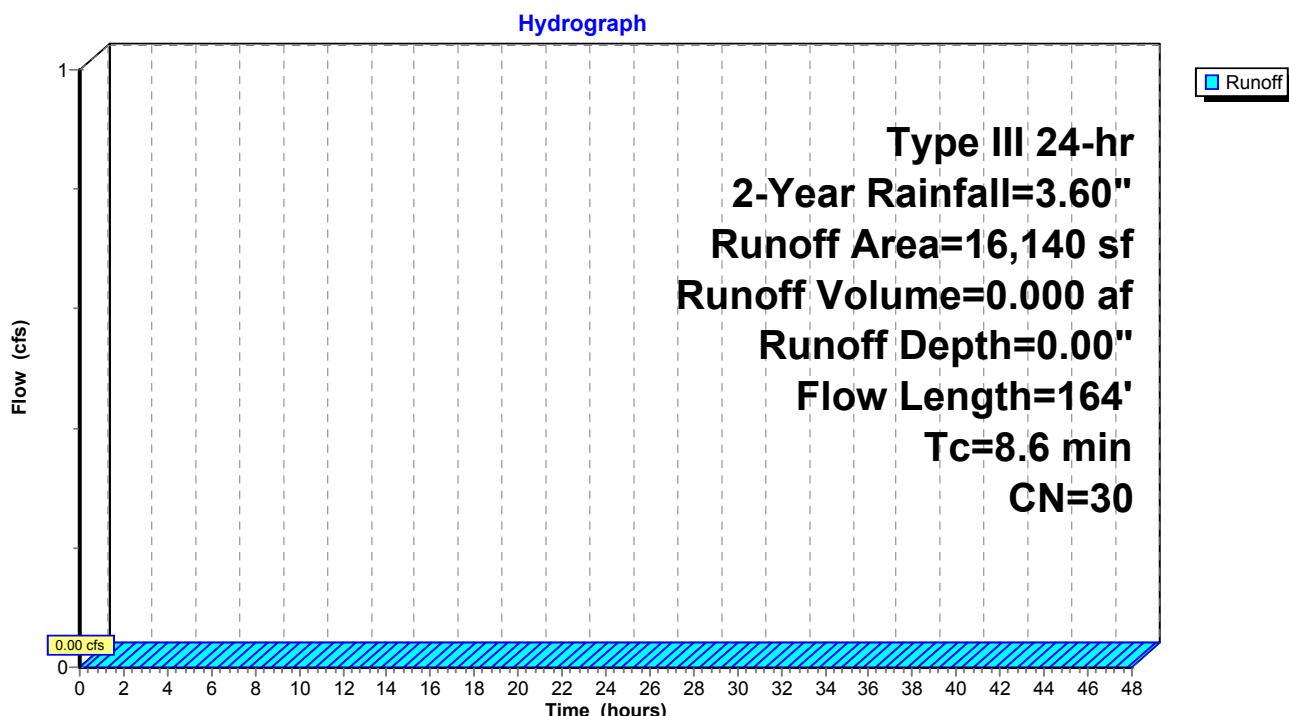
[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description			
16,140	30	Woods, Good, HSG A			
16,140		100.00% Pervious Area			
Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	50	0.0800	0.12		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
1.9	114	0.0383	0.98		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
8.6	164				Total

Subcatchment 2S: Sub-2



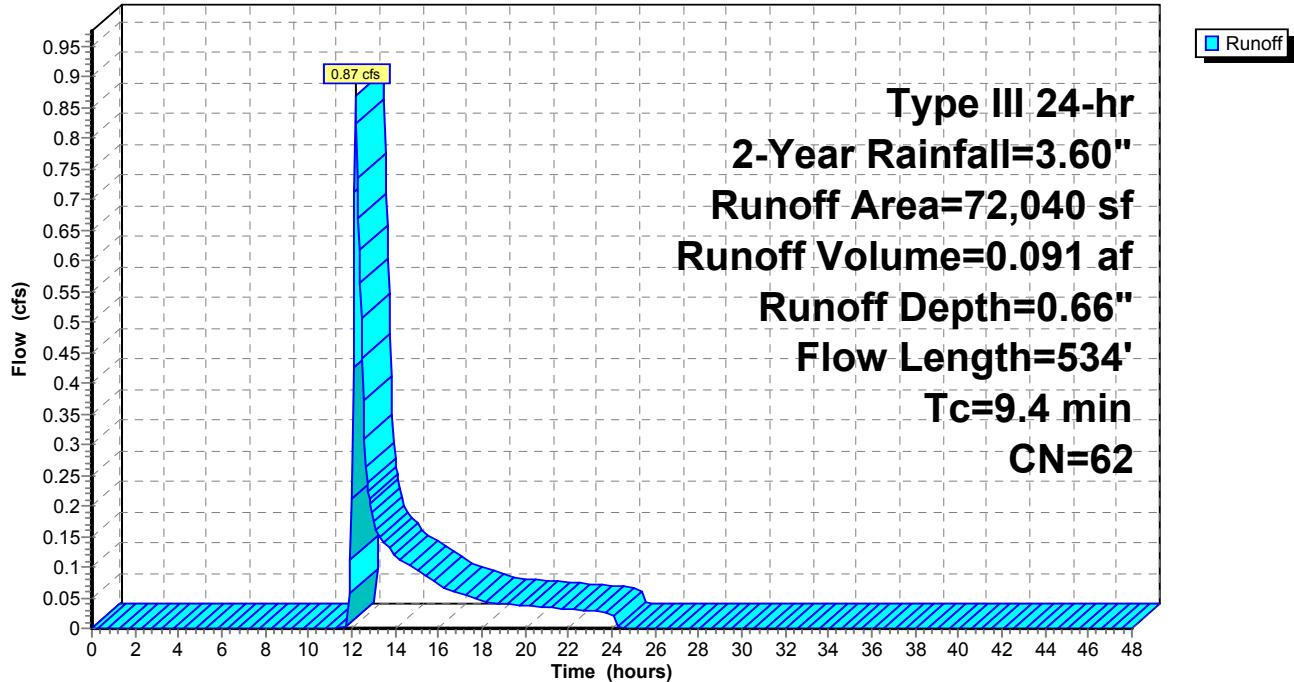
Summary for Subcatchment 3A-S: Sub-3A

Runoff = 0.87 cfs @ 12.16 hrs, Volume= 0.091 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
*	1,384	98 Roofs, HSG A - offsite
*	16,069	98 Paved parking, HSG A - offsite
*	1,682	30 Woods, Good, HSG A - offsite
*	914	>75% Grass cover, Good, HSG A - offsite
24,471	30	Woods, Good, HSG A
6,905	39	>75% Grass cover, Good, HSG A
2,407	98	Paved roads w/curbs & sewers, HSG A
*	2,712	98 Existing Detention Basin, HSG A
*	810	Riprap, HSG A
3,247	98	Paved roads w/curbs & sewers, HSG B
2,784	55	Woods, Good, HSG B
*	938	Riprap, HSG B
6,442	61	>75% Grass cover, Good, HSG B
*	1,275	98 Existing Detention Basin, HSG B
72,040	62	Weighted Average
43,198		59.96% Pervious Area
28,842		40.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.0160	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
1.8	225	0.0160	2.04		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.9	102	0.0090	1.93		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	157	0.0030	2.88	3.54	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
9.4	534	Total			

Subcatchment 3A-S: Sub-3A**Hydrograph**

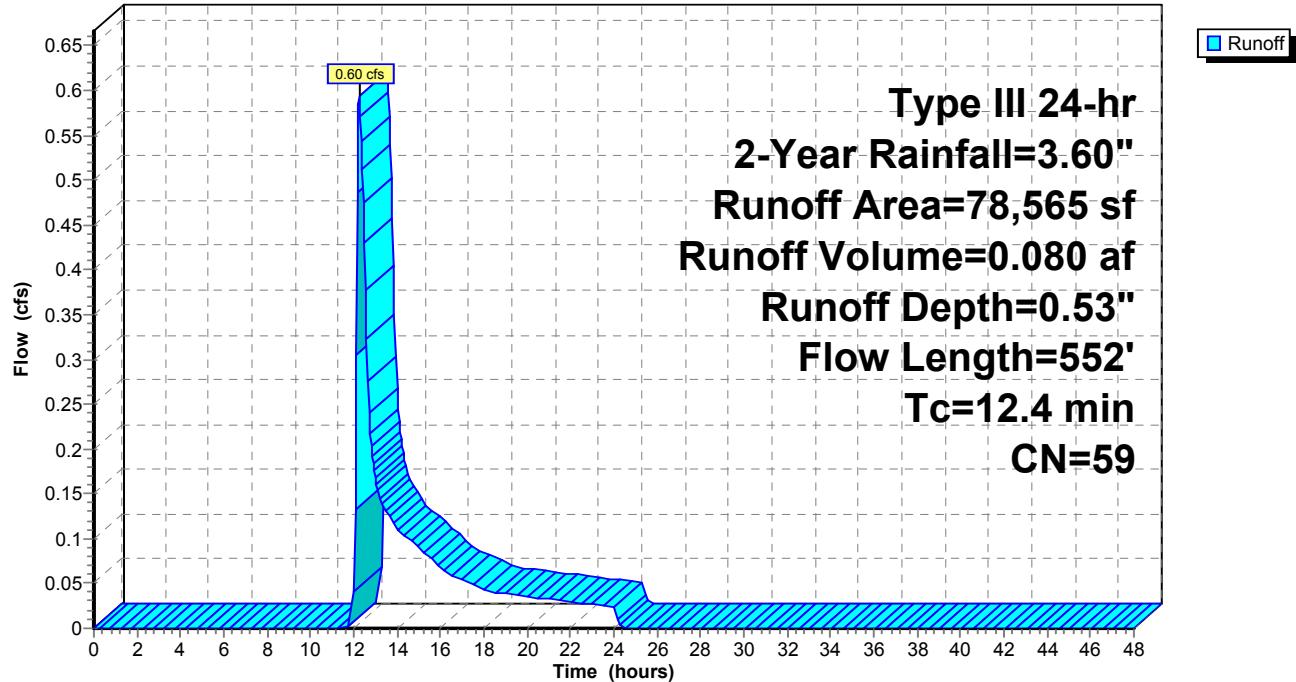
Summary for Subcatchment 3B-S: Sub-3B

Runoff = 0.60 cfs @ 12.24 hrs, Volume= 0.080 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

	Area (sf)	CN	Description
*	285	98	Riprap, HSG A
*	121	98	Riprap, HSG B
	9,681	30	Woods, Good, HSG A
	30,788	55	Woods, Good, HSG B
	1,762	39	>75% Grass cover, Good, HSG A
	8,282	61	>75% Grass cover, Good, HSG B
*	15,816	98	Wetlands, HSG B
*	4,310	30	Woods, Good, HSG A - offsite
*	418	98	Wetlands, HSG B - offsite
*	4,121	39	>75% Grass cover, Good, HSG A - offsite
*	290	98	Paved drive, HSG A - offsite
*	957	61	>75% Grass cover, Good, HSG B - offsite
*	1,734	55	Woods, Good, HSG B - offsite
	78,565	59	Weighted Average
	61,635		78.45% Pervious Area
	16,930		21.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0700	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.60"
1.5	294	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.9	208	0.0030	0.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
12.4	552	Total			

Subcatchment 3B-S: Sub-3B**Hydrograph**

Summary for Subcatchment 4S: Sub-4

Runoff = 0.00 cfs @ 23.98 hrs, Volume= 0.000 af, Depth= 0.00"

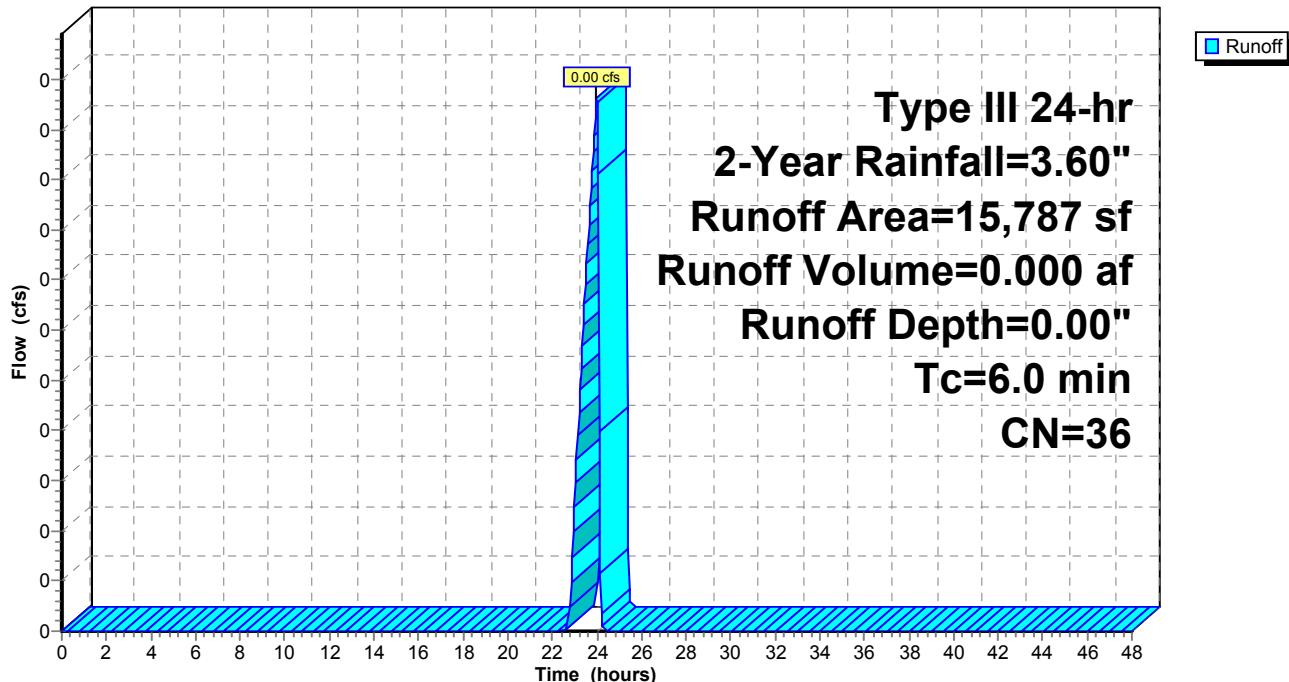
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
15,787	36	Woods, Fair, HSG A
15,787		100.00% Pervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 4S: Sub-4

Hydrograph



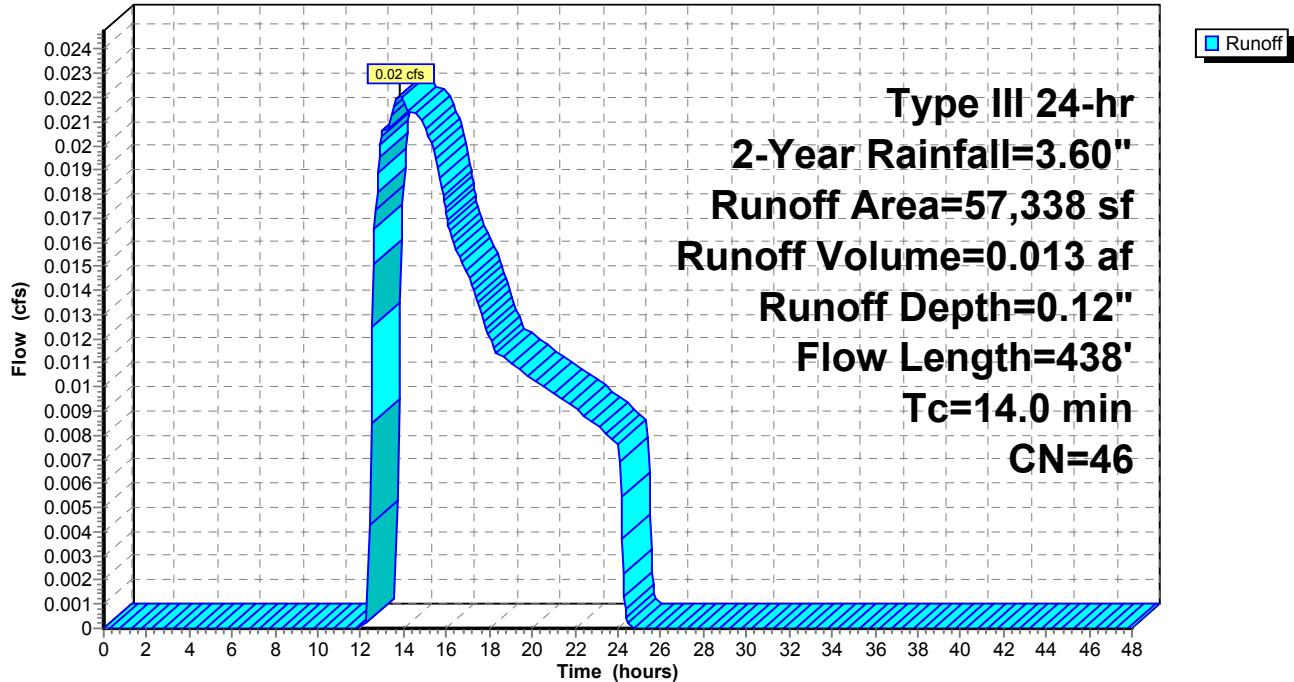
Summary for Subcatchment 5S: Sub-5

Runoff = 0.02 cfs @ 13.80 hrs, Volume= 0.013 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
32,867	36	Woods, Fair, HSG A
15,631	39	>75% Grass cover, Good, HSG A
395	80	>75% Grass cover, Good, HSG D
*	293	Paved drive, HSG D
2,148	98	Roofs, HSG A
*	5,236	Paved drive, HSG A
*	533	Patio, HSG A
*	235	Misc, HSG A
57,338	46	Weighted Average
48,893		85.27% Pervious Area
8,445		14.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	39	0.1538	0.15		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
1.8	11	0.1100	0.10		Sheet Flow, B-C Woods: Light underbrush n= 0.400 P2= 3.60"
0.2	22	0.1166	1.71		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
0.9	54	0.0370	0.96		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
0.6	52	0.0770	1.39		Shallow Concentrated Flow, E-F Woodland Kv= 5.0 fps
5.5	175	0.0114	0.53		Shallow Concentrated Flow, F-G Woodland Kv= 5.0 fps
0.8	85	0.1176	1.71		Shallow Concentrated Flow, G-H Woodland Kv= 5.0 fps
14.0	438	Total			

Subcatchment 5S: Sub-5**Hydrograph**

Summary for Reach DP-1: DP-1

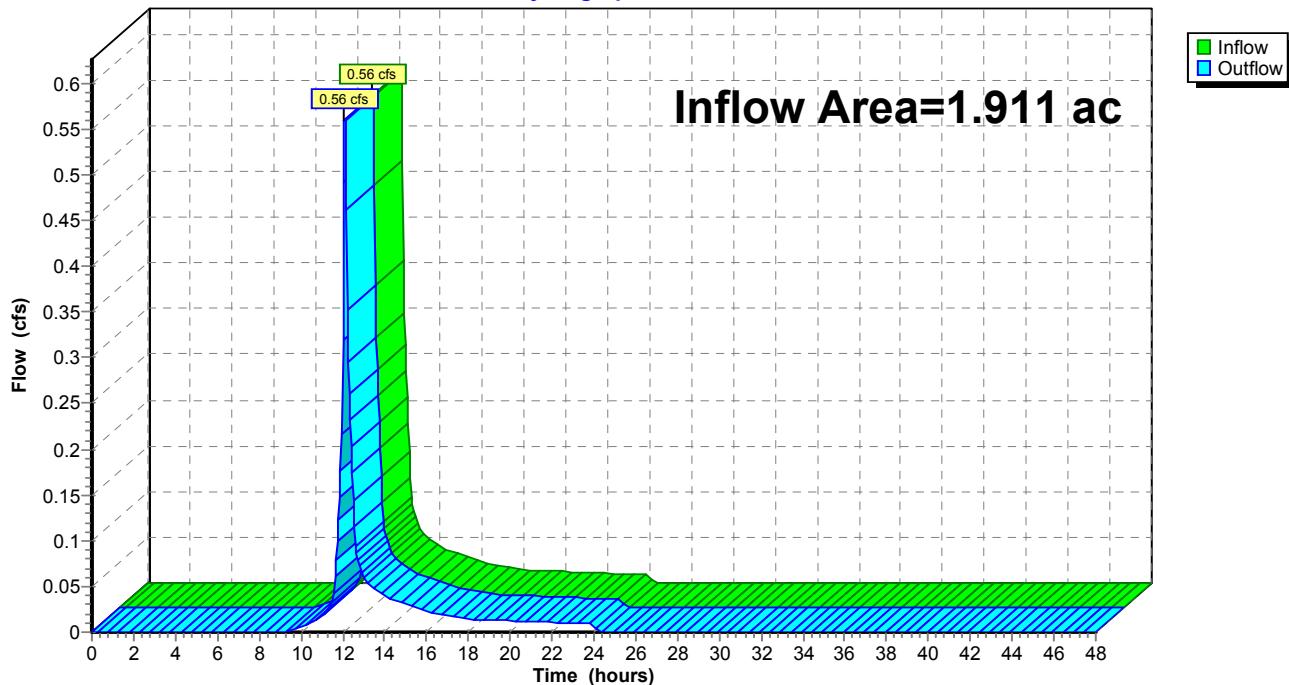
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.911 ac, 11.60% Impervious, Inflow Depth = 0.26" for 2-Year event
 Inflow = 0.56 cfs @ 12.10 hrs, Volume= 0.042 af
 Outflow = 0.56 cfs @ 12.10 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-1: DP-1

Hydrograph



Summary for Reach DP-2: DP-2

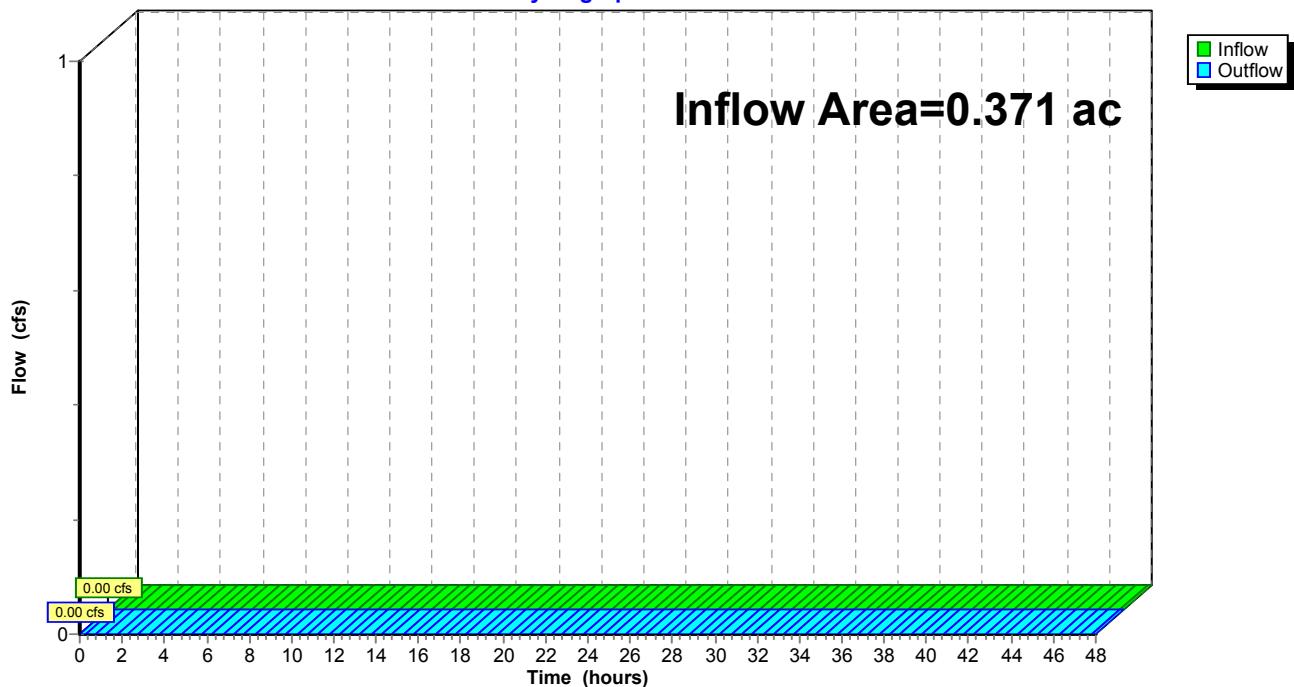
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.371 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-2: DP-2

Hydrograph



Summary for Reach DP-3: DP-3

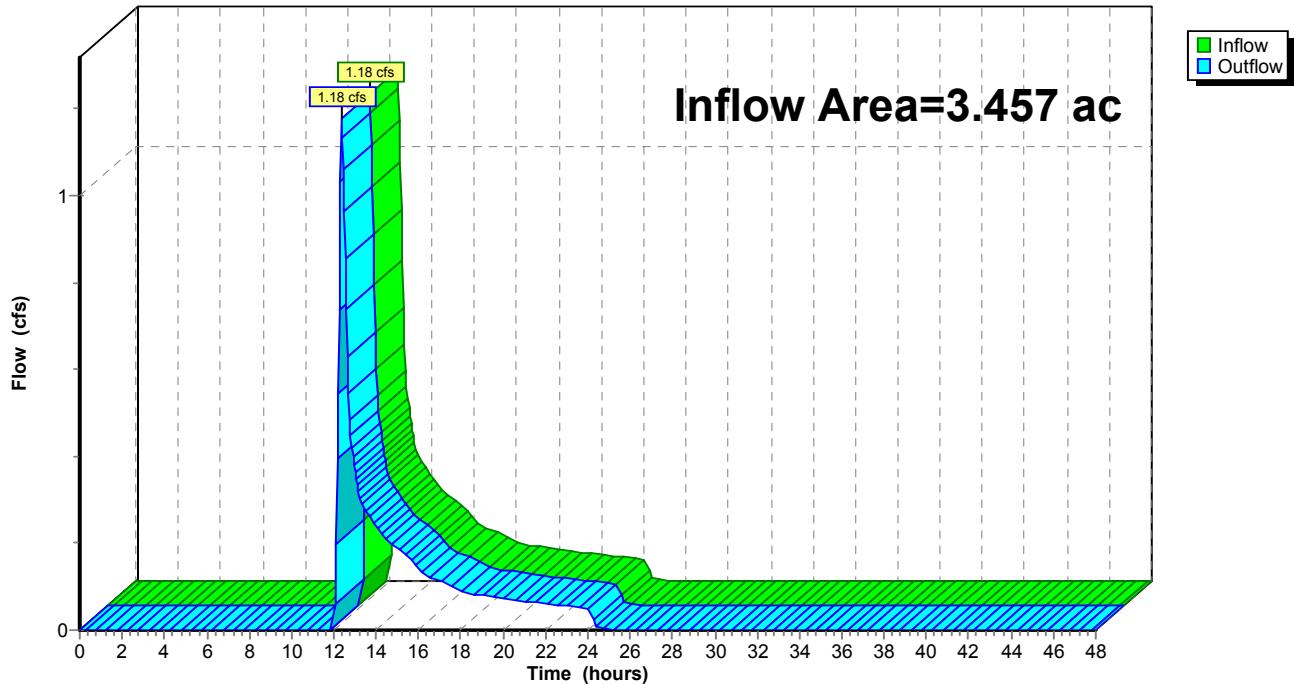
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.457 ac, 30.39% Impervious, Inflow Depth = 0.55" for 2-Year event
 Inflow = 1.18 cfs @ 12.36 hrs, Volume= 0.159 af
 Outflow = 1.18 cfs @ 12.36 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-3: DP-3

Hydrograph



Summary for Reach DP-4: PL

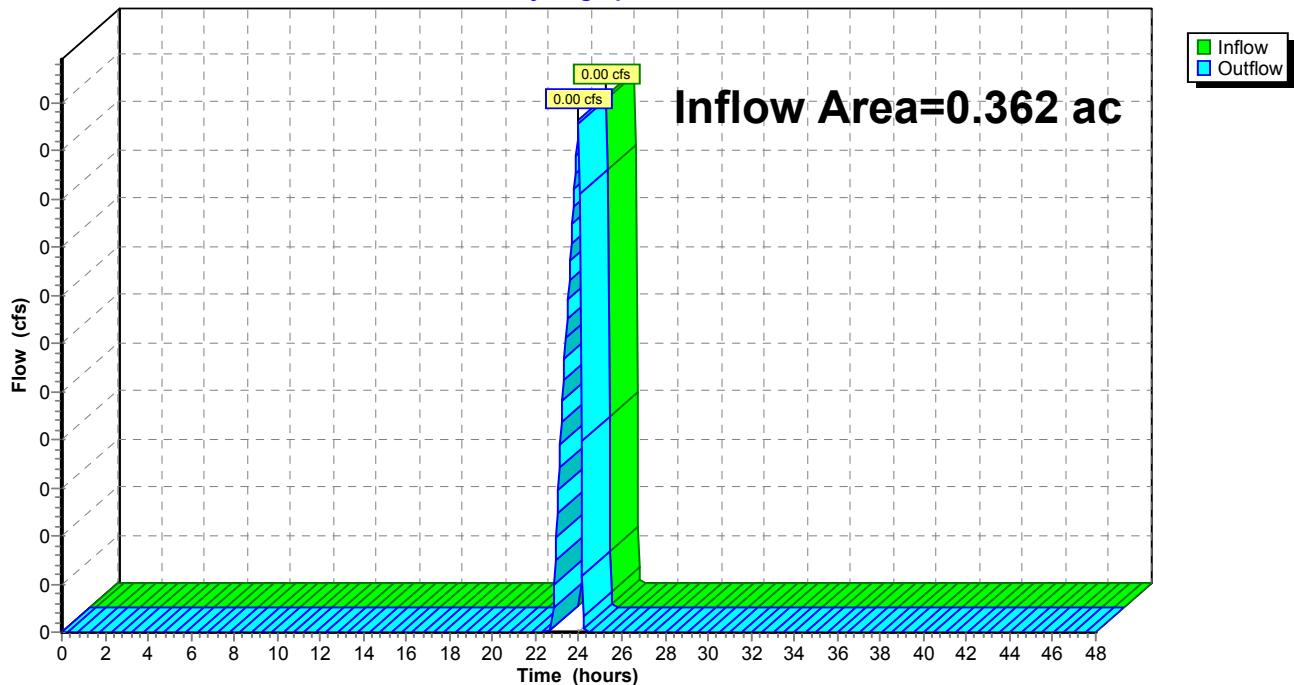
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.362 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
 Inflow = 0.00 cfs @ 23.98 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 23.98 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-4: PL

Hydrograph



Summary for Reach DP-5: PL

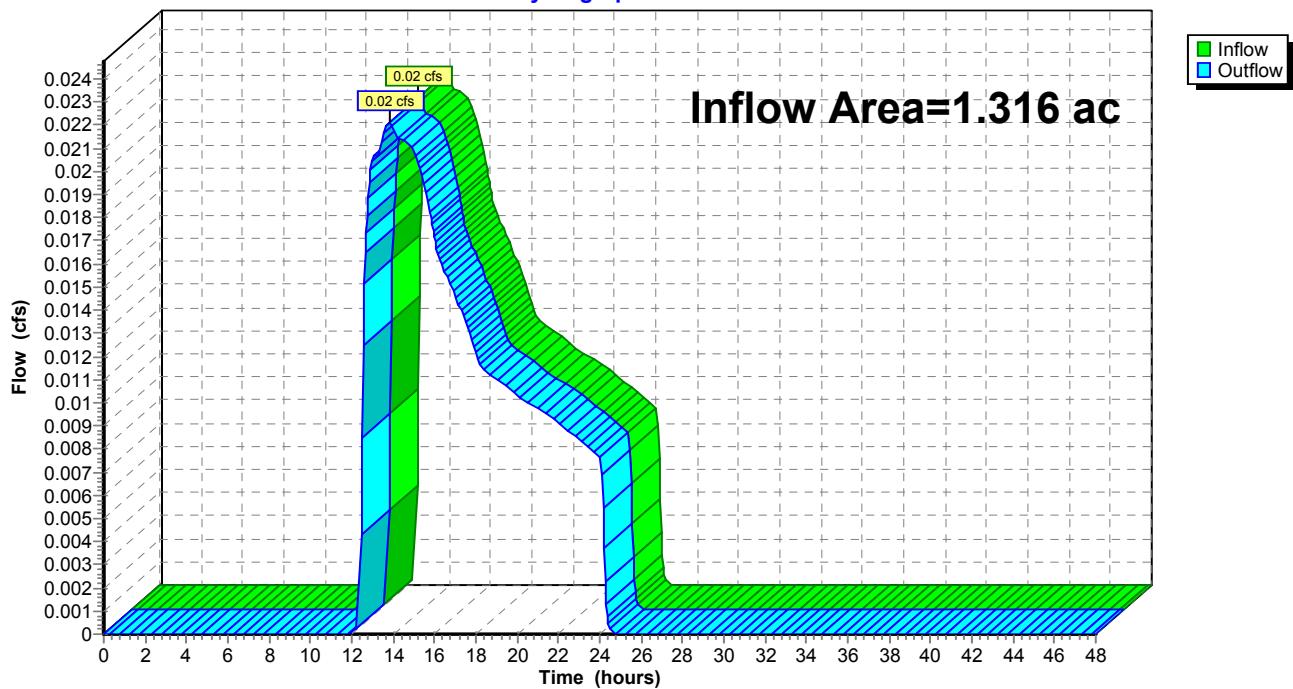
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.316 ac, 14.73% Impervious, Inflow Depth = 0.12" for 2-Year event
 Inflow = 0.02 cfs @ 13.80 hrs, Volume= 0.013 af
 Outflow = 0.02 cfs @ 13.80 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-5: PL

Hydrograph



Summary for Pond D-1: Exist Detention Basin

Inflow Area = 0.720 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

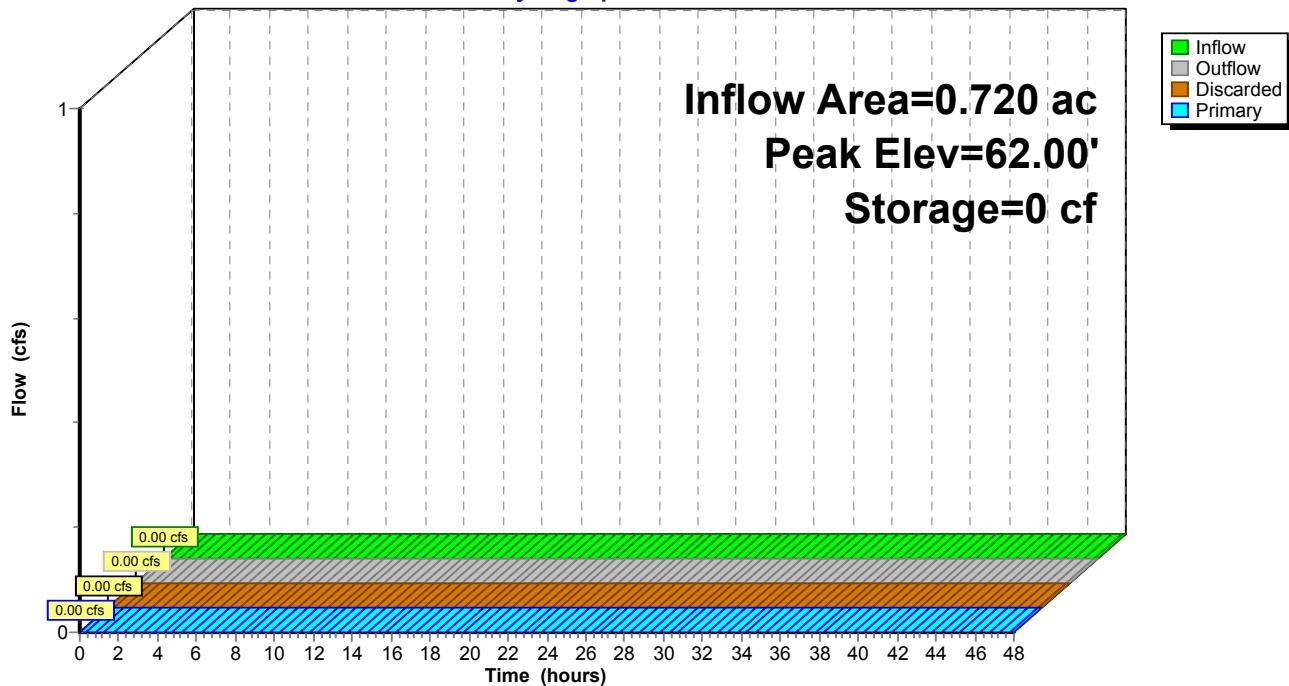
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 62.00' @ 0.00 hrs Surf.Area= 4,336 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description	
#1	62.00'	5,584 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
62.00	4,336	0	0	
63.00	6,832	5,584	5,584	
Device	Routing	Invert	Outlet Devices	
#1	Primary	63.00'	10.0' long x 4.0' breadth Broad-Crested Rectangular Weir	
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00	
			2.50 3.00 3.50 4.00 4.50 5.00 5.50	
			Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66	
			2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32	
#2	Discarded	62.00'	8.270 in/hr Exfiltration over Surface area	Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.00' (Free Discharge)
 ↑ 2=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.00' TW=0.00' (Dynamic Tailwater)
 ↑ 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond D-1: Exist Detention Basin**Hydrograph**

Summary for Pond E-DB: Exist Detention Basin

Inflow Area = 1.654 ac, 40.04% Impervious, Inflow Depth = 0.66" for 2-Year event
 Inflow = 0.87 cfs @ 12.16 hrs, Volume= 0.091 af
 Outflow = 0.62 cfs @ 12.36 hrs, Volume= 0.079 af, Atten= 28%, Lag= 11.8 min
 Primary = 0.62 cfs @ 12.36 hrs, Volume= 0.079 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 58.79' @ 12.36 hrs Surf.Area= 1,290 sf Storage= 687 cf

Plug-Flow detention time= 98.0 min calculated for 0.079 af (86% of inflow)
 Center-of-Mass det. time= 34.4 min (934.0 - 899.7)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	7,013 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

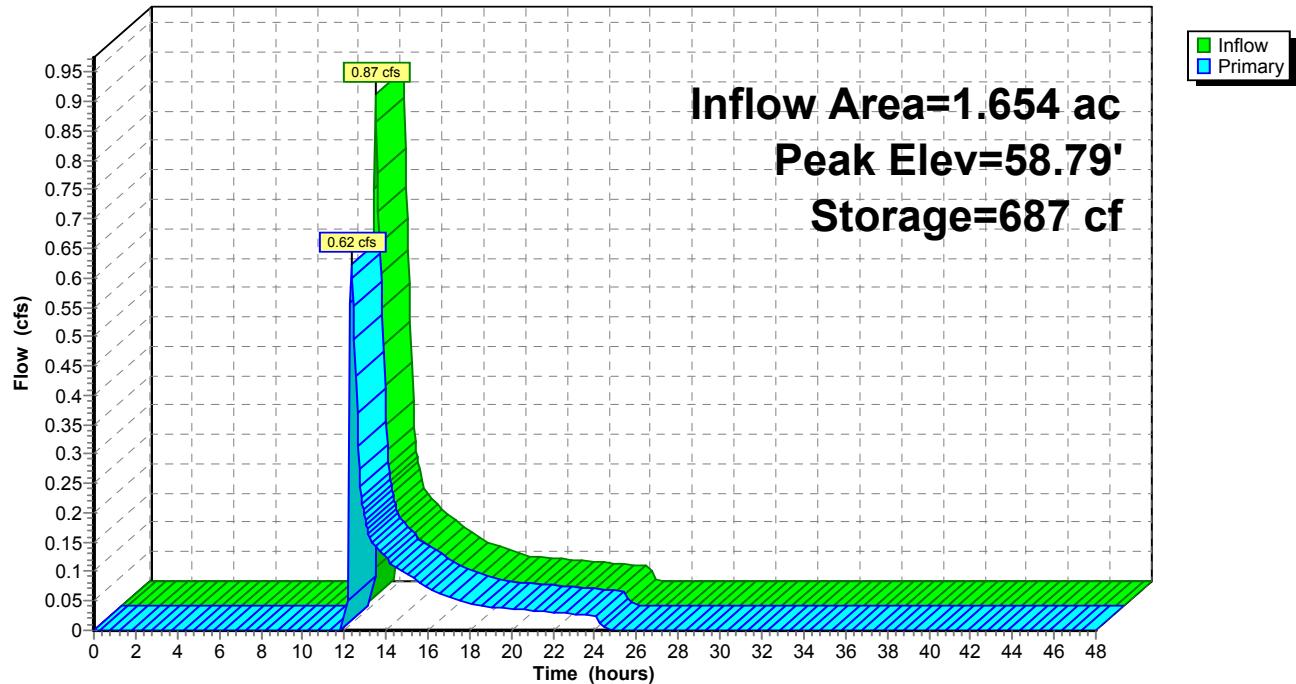
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	445	0	0
59.00	1,511	978	978
60.00	3,286	2,399	3,377
61.00	3,987	3,637	7,013

Device	Routing	Invert	Outlet Devices
#1	Primary	58.12'	12.0" Round RCP_Round 12" L= 25.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 58.12' / 58.05' S= 0.0028 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	58.68'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.61 cfs @ 12.36 hrs HW=58.79' TW=56.02' (Dynamic Tailwater)

↑ 1=RCP_Round 12" (Passes 0.61 cfs of 1.03 cfs potential flow)

↑ 2=Sharp-Crested Rectangular Weir (Weir Controls 0.61 cfs @ 1.11 fps)

Pond E-DB: Exist Detention Basin**Hydrograph**

Summary for Pond W1: BVW

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 3.457 ac, 30.39% Impervious, Inflow Depth = 0.55" for 2-Year event
 Inflow = 1.16 cfs @ 12.34 hrs, Volume= 0.159 af
 Outflow = 1.18 cfs @ 12.36 hrs, Volume= 0.159 af, Atten= 0%, Lag= 1.2 min
 Primary = 1.18 cfs @ 12.36 hrs, Volume= 0.159 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 56.02' @ 12.36 hrs Surf.Area= 4,222 sf Storage= 102 cf

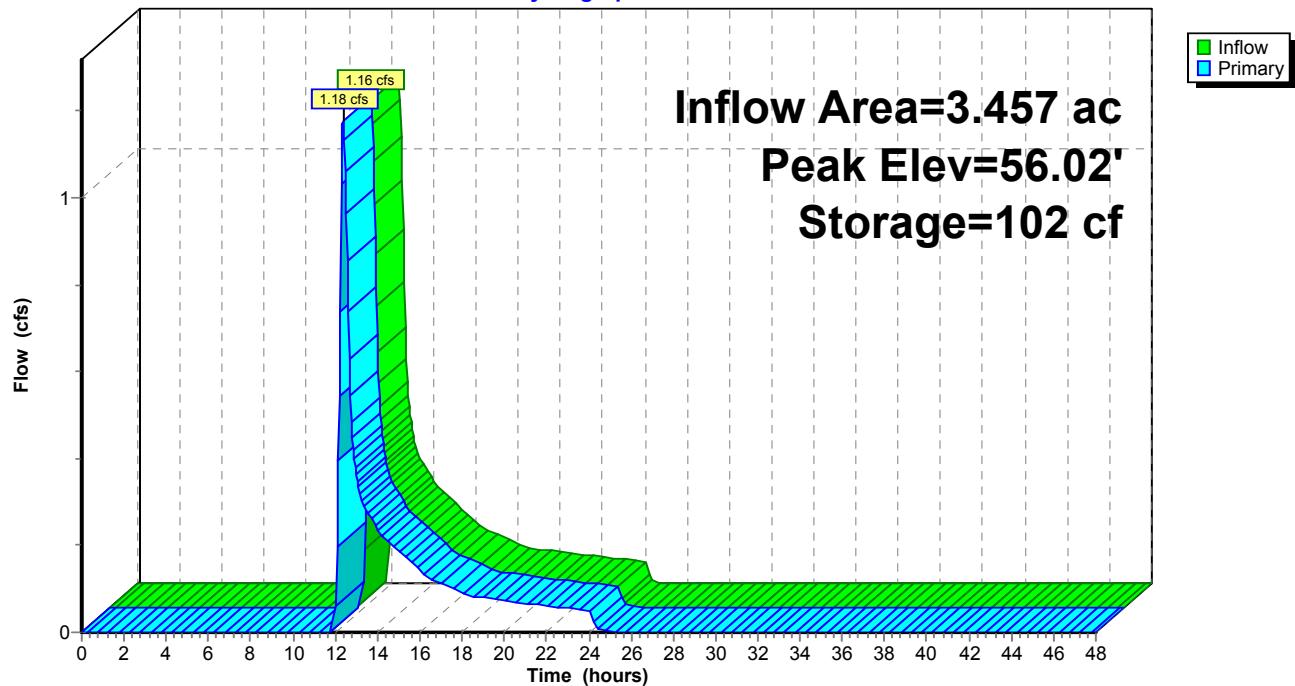
Plug-Flow detention time= 2.8 min calculated for 0.159 af (100% of inflow)
 Center-of-Mass det. time= 2.6 min (927.7 - 925.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	56.00'	11,314 cf	Custom Stage Data (Irregular)	Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	3,962	413.1	0	0	3,962
57.00	20,884	797.8	11,314	11,314	41,037

Device	Routing	Invert	Outlet Devices	
#1	Primary	56.00'	120.0' long x 10.0' breadth Broad-Crested Rectangular Weir	
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60	
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64	

Primary OutFlow Max=1.16 cfs @ 12.36 hrs HW=56.02' TW=0.00' (Dynamic Tailwater)

↑1=Broad-Crested Rectangular Weir(Weir Controls 1.16 cfs @ 0.39 fps)

Pond W1: BVW**Hydrograph**

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1A-S: Sub-1A	Runoff Area=12,960 sf 68.56% Impervious Runoff Depth=2.63" Tc=6.0 min CN=79 Runoff=0.90 cfs 0.065 af
Subcatchment1B-S: Sub-1B	Runoff Area=31,377 sf 0.00% Impervious Runoff Depth=0.06" Flow Length=212' Tc=9.6 min CN=35 Runoff=0.01 cfs 0.004 af
Subcatchment1C-S: Sub-1C	Runoff Area=19,404 sf 0.00% Impervious Runoff Depth=0.11" Flow Length=269' Tc=16.6 min CN=37 Runoff=0.01 cfs 0.004 af
Subcatchment1D-S: Sub-1D	Runoff Area=19,501 sf 3.95% Impervious Runoff Depth=0.19" Flow Length=185' Tc=11.0 min CN=40 Runoff=0.01 cfs 0.007 af
Subcatchment2S: Sub-2	Runoff Area=16,140 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=164' Tc=8.6 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment3A-S: Sub-3A	Runoff Area=72,040 sf 40.04% Impervious Runoff Depth=1.32" Flow Length=534' Tc=9.4 min CN=62 Runoff=2.04 cfs 0.181 af
Subcatchment3B-S: Sub-3B	Runoff Area=78,565 sf 21.55% Impervious Runoff Depth=1.12" Flow Length=552' Tc=12.4 min CN=59 Runoff=1.63 cfs 0.169 af
Subcatchment4S: Sub-4	Runoff Area=15,787 sf 0.00% Impervious Runoff Depth=0.08" Tc=6.0 min CN=36 Runoff=0.00 cfs 0.002 af
Subcatchment5S: Sub-5	Runoff Area=57,338 sf 14.73% Impervious Runoff Depth=0.42" Flow Length=438' Tc=14.0 min CN=46 Runoff=0.23 cfs 0.046 af
Reach DP-1: DP-1	Inflow=0.90 cfs 0.076 af Outflow=0.90 cfs 0.076 af
Reach DP-2: DP-2	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach DP-3: DP-3	Inflow=3.21 cfs 0.338 af Outflow=3.21 cfs 0.338 af
Reach DP-4: PL	Inflow=0.00 cfs 0.002 af Outflow=0.00 cfs 0.002 af
Reach DP-5: PL	Inflow=0.23 cfs 0.046 af Outflow=0.23 cfs 0.046 af
Pond D-1: Exist Detention Basin	Peak Elev=62.00' Storage=0 cf Inflow=0.01 cfs 0.004 af Discarded=0.01 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af
Pond E-DB: Exist Detention Basin	Peak Elev=59.00' Storage=976 cf Inflow=2.04 cfs 0.181 af Outflow=1.62 cfs 0.169 af

27-135 Pre-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

*Type III 24-hr 10-Year Rainfall=4.80"*Page 33**Pond W1: BVW**Peak Elev=56.05' Storage=205 cf Inflow=3.23 cfs 0.338 af
Outflow=3.21 cfs 0.338 af**Total Runoff Area = 7.418 ac Runoff Volume = 0.479 af Average Runoff Depth = 0.78"
80.23% Pervious = 5.951 ac 19.77% Impervious = 1.466 ac**

Summary for Subcatchment 1A-S: Sub-1A

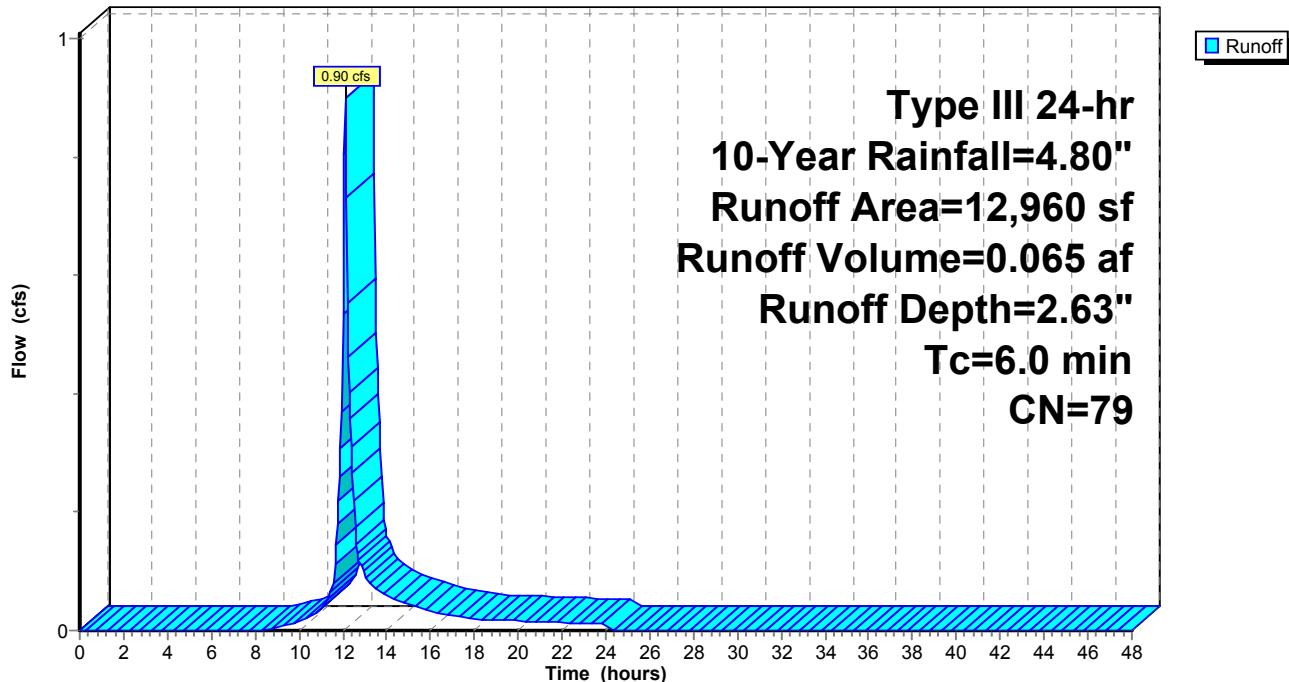
Runoff = 0.90 cfs @ 12.09 hrs, Volume= 0.065 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description			
4,075	39	>75% Grass cover, Good, HSG A			
8,885	98	Paved roads w/curbs & sewers, HSG A			
12,960	79	Weighted Average			
4,075		31.44% Pervious Area			
8,885		68.56% Impervious Area			
Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1A-S: Sub-1A

Hydrograph



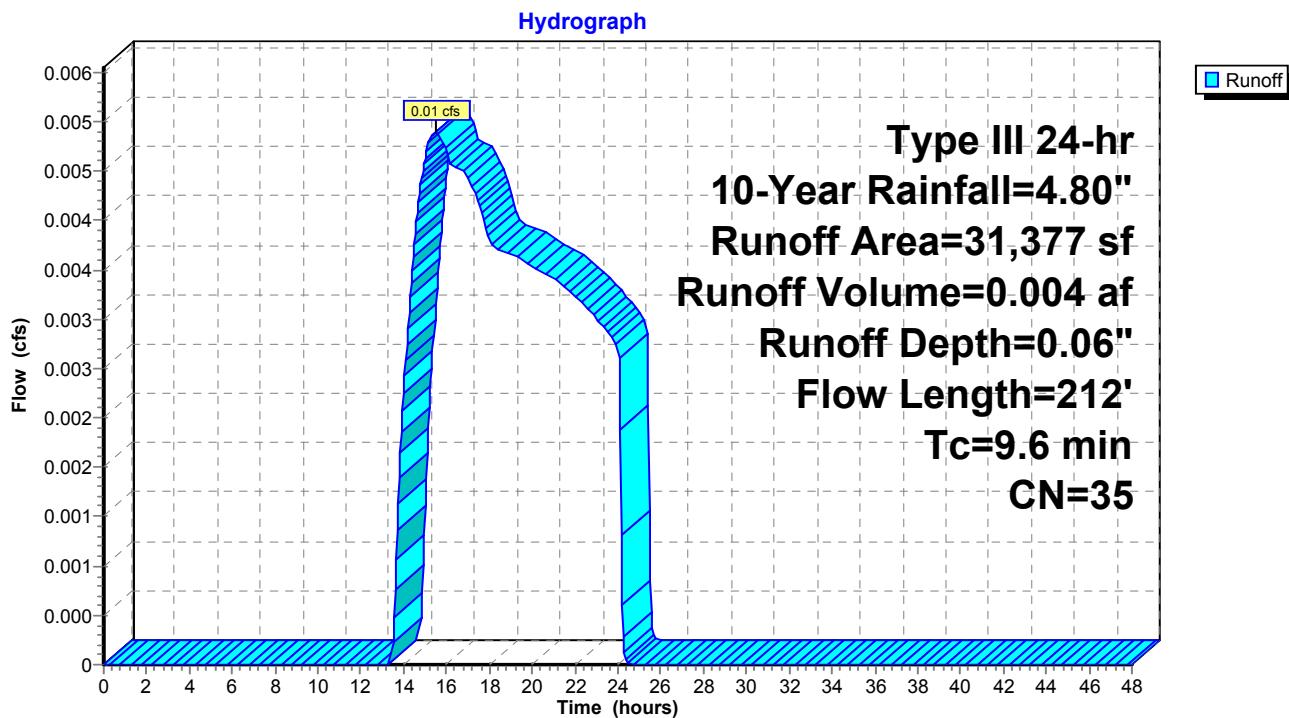
Summary for Subcatchment 1B-S: Sub-1B

Runoff = 0.01 cfs @ 15.51 hrs, Volume= 0.004 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description			
22,072	30	Woods, Good, HSG A			
1,755	39	>75% Grass cover, Good, HSG A			
7,550	49	50-75% Grass cover, Fair, HSG A			
31,377	35	Weighted Average			
31,377		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.60"
1.5	162	0.0120	1.76		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.6	212				Total

Subcatchment 1B-S: Sub-1B



Summary for Subcatchment 1C-S: Sub-1C

Runoff = 0.01 cfs @ 15.01 hrs, Volume= 0.004 af, Depth= 0.11"

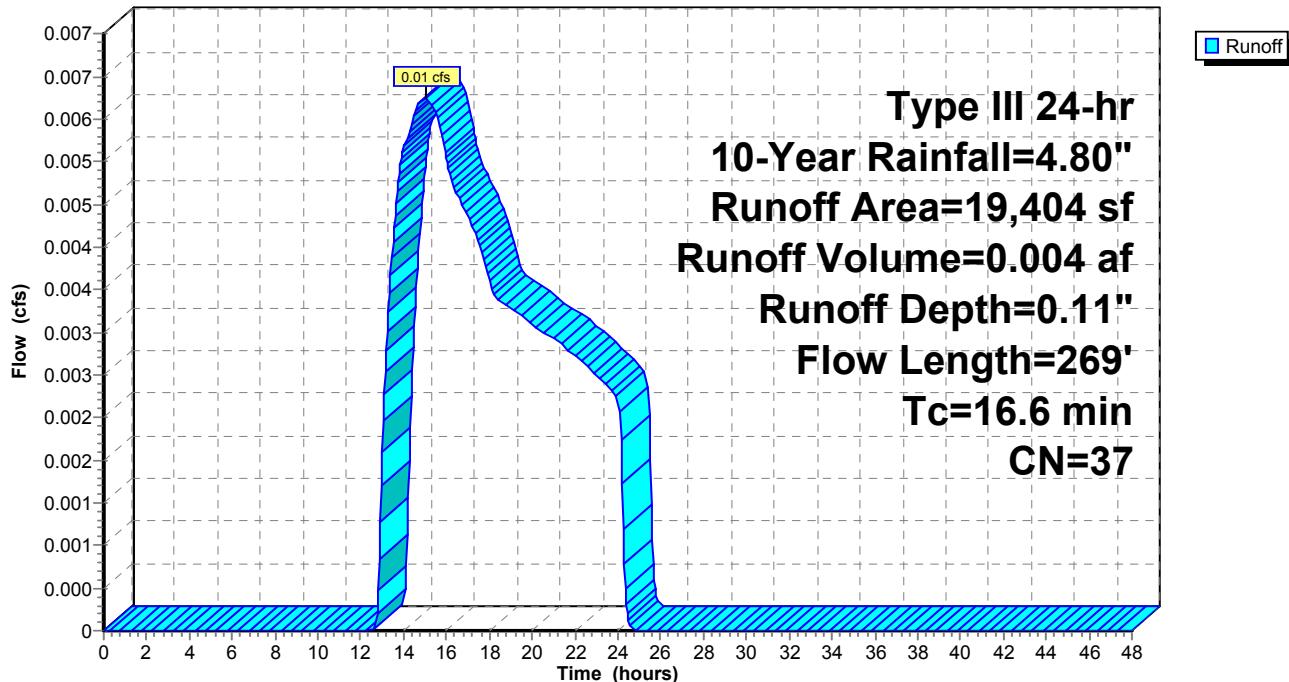
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
*	12,129	30 Woods, Good, HSG A
	1,513	>75% Grass cover, Good, HSG A
	3,840	55 Woods, Good, HSG B
	899	30 Woods, Good, HSG A - offsite
	1,023	49 50-75% Grass cover, Fair, HSG A
19,404	37	Weighted Average
19,404		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	50	0.0120	0.06		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
2.3	219	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
16.6	269	Total			

Subcatchment 1C-S: Sub-1C

Hydrograph



Summary for Subcatchment 1D-S: Sub-1D

Runoff = 0.01 cfs @ 12.56 hrs, Volume= 0.007 af, Depth= 0.19"

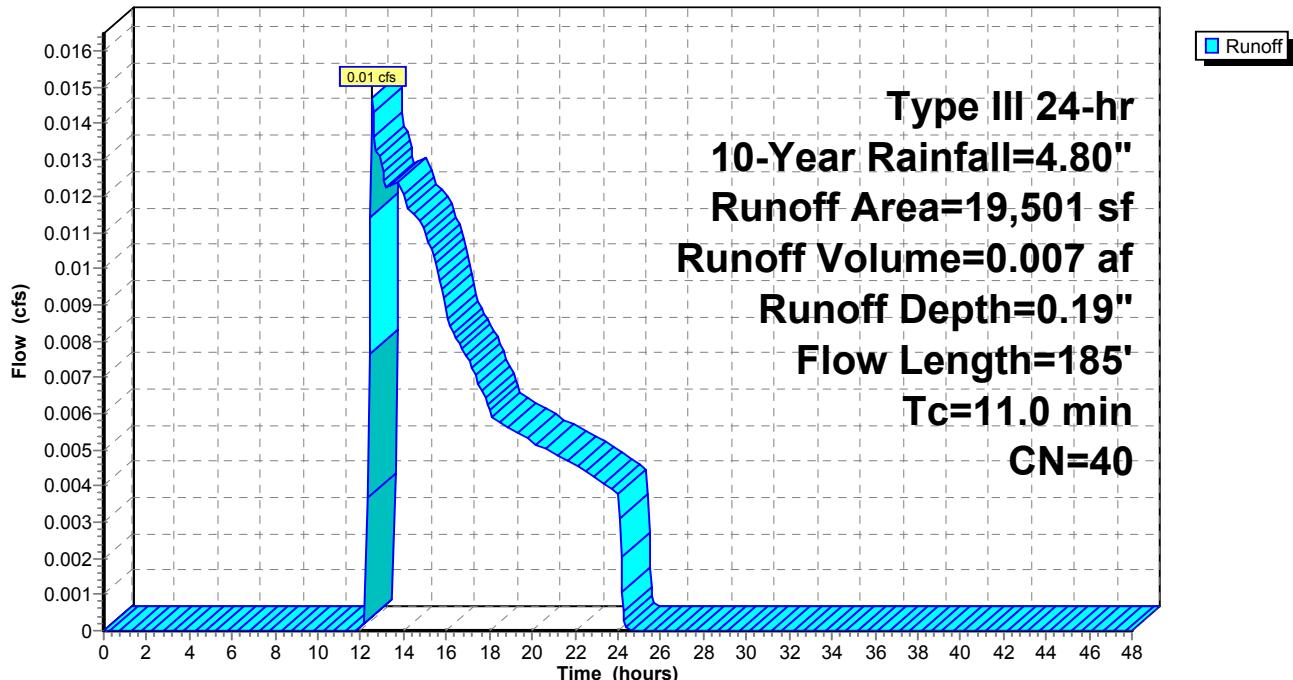
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
10,890	39	>75% Grass cover, Good, HSG A
2,684	49	50-75% Grass cover, Fair, HSG A
*	98	Rubble Pile, HSG A
	30	Woods, Good, HSG A
	40	Weighted Average
		96.05% Pervious Area
5,157		3.95% Impervious Area
19,501		
18,731		
770		

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0300	0.08		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
1.1	135	0.0160	2.04		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
11.0	185	Total			

Subcatchment 1D-S: Sub-1D

Hydrograph



Summary for Subcatchment 2S: Sub-2

Runoff = 0.00 cfs @ 23.98 hrs, Volume= 0.000 af, Depth= 0.00"

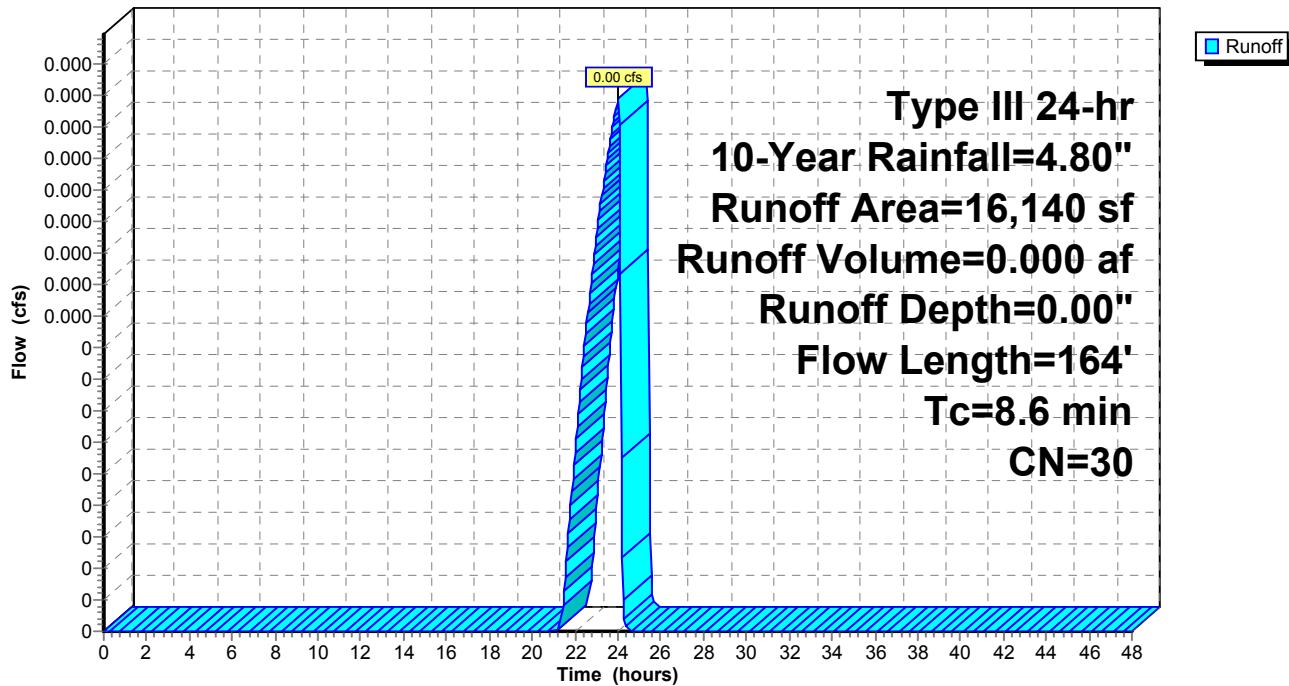
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
16,140	30	Woods, Good, HSG A
16,140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	50	0.0800	0.12		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
1.9	114	0.0383	0.98		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
8.6	164				Total

Subcatchment 2S: Sub-2

Hydrograph



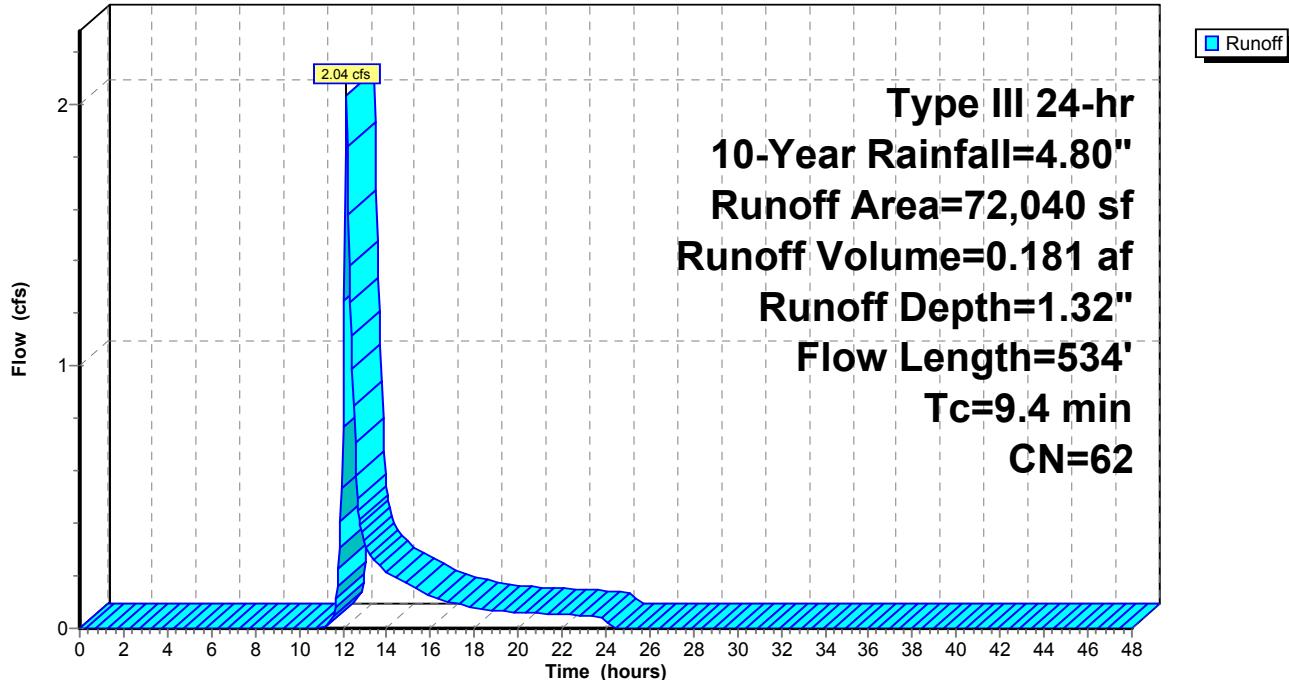
Summary for Subcatchment 3A-S: Sub-3A

Runoff = 2.04 cfs @ 12.15 hrs, Volume= 0.181 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
*	1,384	98 Roofs, HSG A - offsite
*	16,069	98 Paved parking, HSG A - offsite
*	1,682	30 Woods, Good, HSG A - offsite
*	914	>75% Grass cover, Good, HSG A - offsite
24,471	30	Woods, Good, HSG A
6,905	39	>75% Grass cover, Good, HSG A
2,407	98	Paved roads w/curbs & sewers, HSG A
*	2,712	98 Existing Detention Basin, HSG A
*	810	Riprap, HSG A
3,247	98	Paved roads w/curbs & sewers, HSG B
2,784	55	Woods, Good, HSG B
*	938	Riprap, HSG B
6,442	61	>75% Grass cover, Good, HSG B
*	1,275	98 Existing Detention Basin, HSG B
72,040	62	Weighted Average
43,198		59.96% Pervious Area
28,842		40.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.0160	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
1.8	225	0.0160	2.04		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.9	102	0.0090	1.93		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	157	0.0030	2.88	3.54	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
9.4	534	Total			

Subcatchment 3A-S: Sub-3A**Hydrograph**

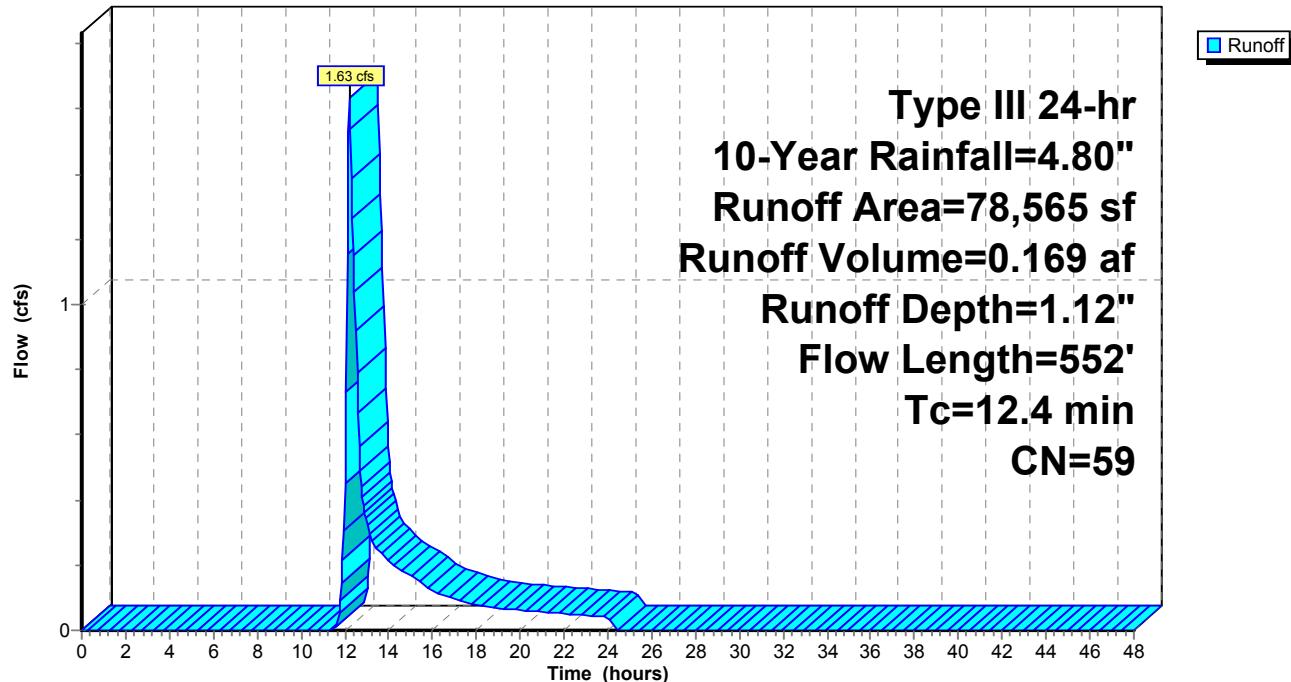
Summary for Subcatchment 3B-S: Sub-3B

Runoff = 1.63 cfs @ 12.20 hrs, Volume= 0.169 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	285	98	Riprap, HSG A
*	121	98	Riprap, HSG B
	9,681	30	Woods, Good, HSG A
	30,788	55	Woods, Good, HSG B
	1,762	39	>75% Grass cover, Good, HSG A
	8,282	61	>75% Grass cover, Good, HSG B
*	15,816	98	Wetlands, HSG B
*	4,310	30	Woods, Good, HSG A - offsite
*	418	98	Wetlands, HSG B - offsite
*	4,121	39	>75% Grass cover, Good, HSG A - offsite
*	290	98	Paved drive, HSG A - offsite
*	957	61	>75% Grass cover, Good, HSG B - offsite
*	1,734	55	Woods, Good, HSG B - offsite
	78,565	59	Weighted Average
	61,635		78.45% Pervious Area
	16,930		21.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0700	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.60"
1.5	294	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.9	208	0.0030	0.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
12.4	552	Total			

Subcatchment 3B-S: Sub-3B**Hydrograph**

Summary for Subcatchment 4S: Sub-4

Runoff = 0.00 cfs @ 15.13 hrs, Volume= 0.002 af, Depth= 0.08"

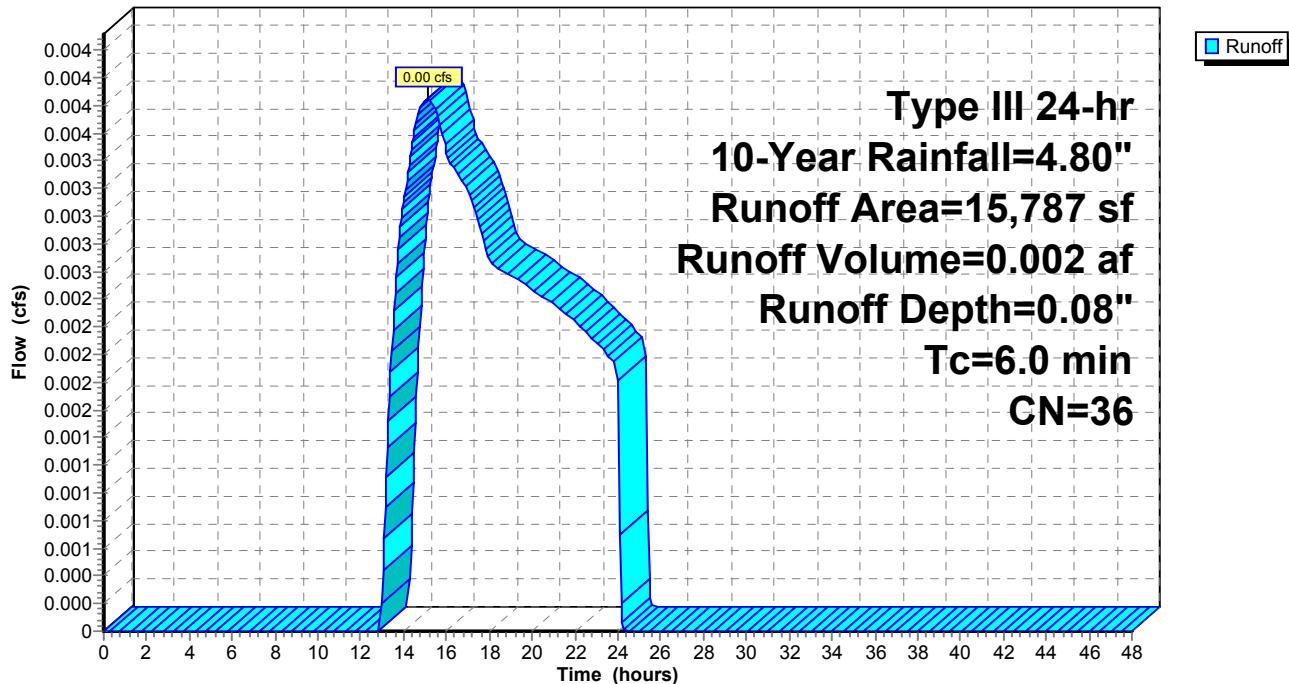
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
15,787	36	Woods, Fair, HSG A
15,787		100.00% Pervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 4S: Sub-4

Hydrograph



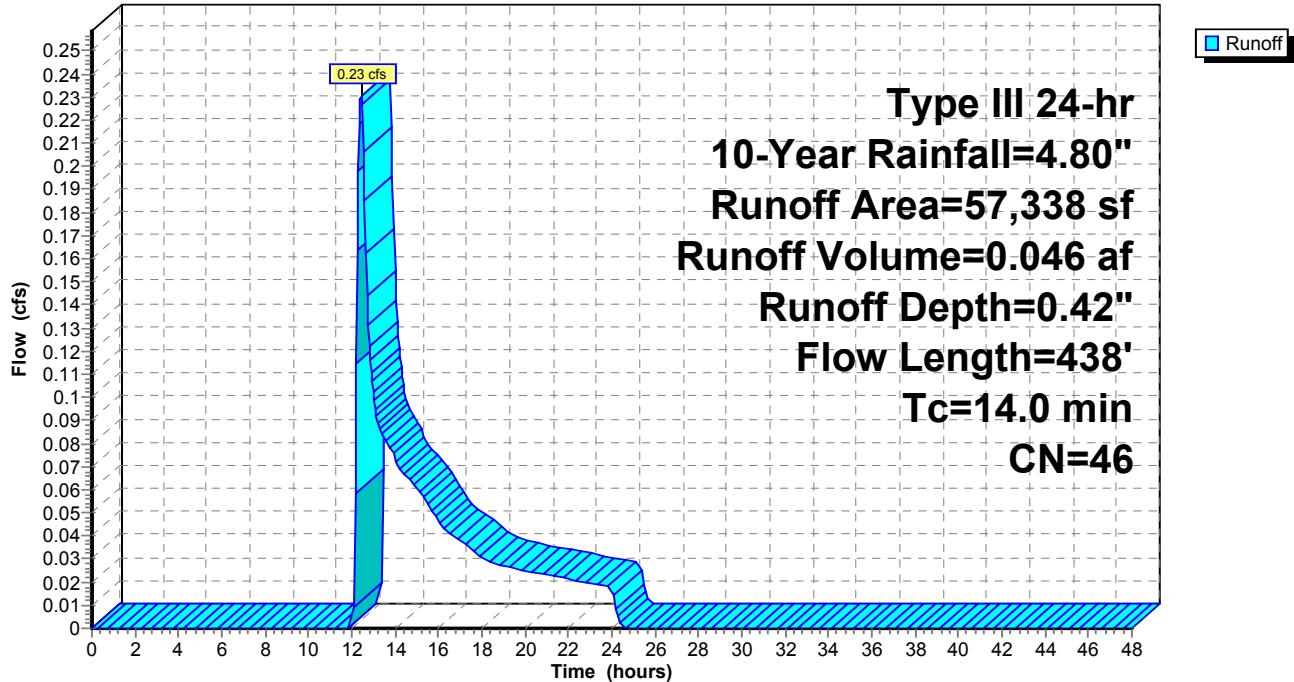
Summary for Subcatchment 5S: Sub-5

Runoff = 0.23 cfs @ 12.43 hrs, Volume= 0.046 af, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
32,867	36	Woods, Fair, HSG A
15,631	39	>75% Grass cover, Good, HSG A
395	80	>75% Grass cover, Good, HSG D
*	293	Paved drive, HSG D
2,148	98	Roofs, HSG A
*	5,236	Paved drive, HSG A
*	533	Patio, HSG A
*	235	Misc, HSG A
57,338	46	Weighted Average
48,893		85.27% Pervious Area
8,445		14.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	39	0.1538	0.15		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
1.8	11	0.1100	0.10		Sheet Flow, B-C Woods: Light underbrush n= 0.400 P2= 3.60"
0.2	22	0.1166	1.71		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
0.9	54	0.0370	0.96		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
0.6	52	0.0770	1.39		Shallow Concentrated Flow, E-F Woodland Kv= 5.0 fps
5.5	175	0.0114	0.53		Shallow Concentrated Flow, F-G Woodland Kv= 5.0 fps
0.8	85	0.1176	1.71		Shallow Concentrated Flow, G-H Woodland Kv= 5.0 fps
14.0	438	Total			

Subcatchment 5S: Sub-5**Hydrograph**

Summary for Reach DP-1: DP-1

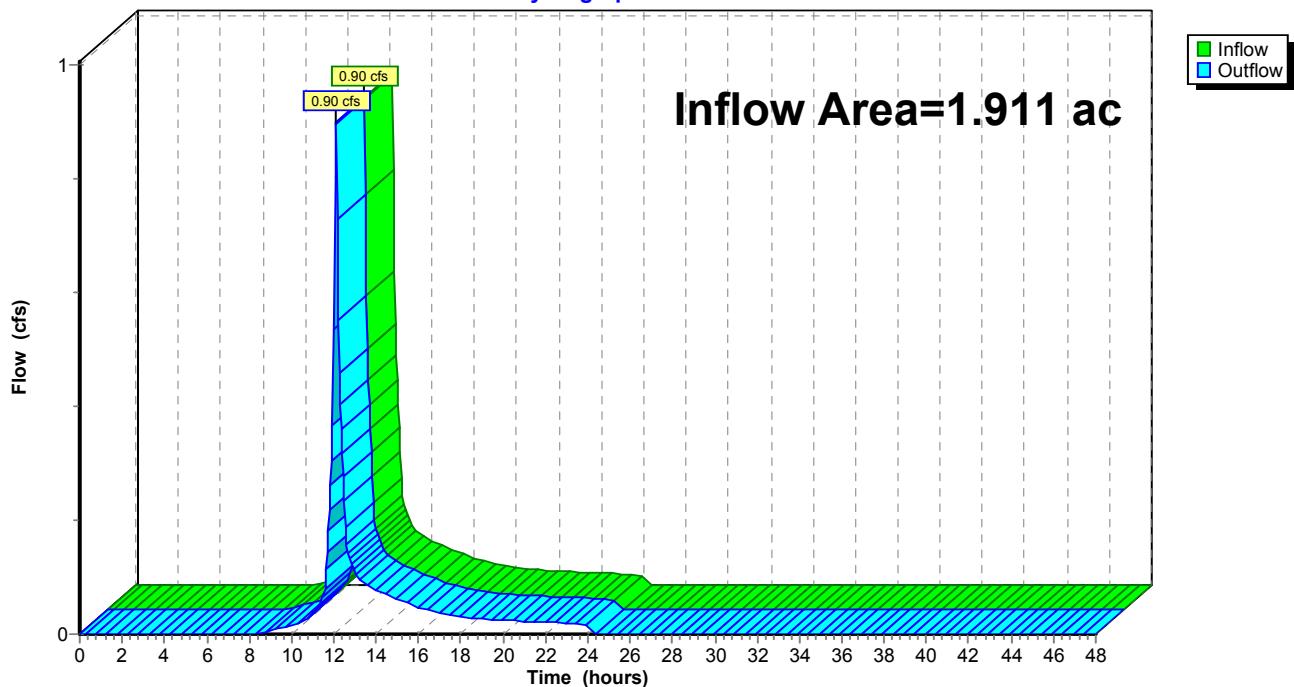
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.911 ac, 11.60% Impervious, Inflow Depth = 0.48" for 10-Year event
 Inflow = 0.90 cfs @ 12.09 hrs, Volume= 0.076 af
 Outflow = 0.90 cfs @ 12.09 hrs, Volume= 0.076 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-1: DP-1

Hydrograph



Summary for Reach DP-2: DP-2

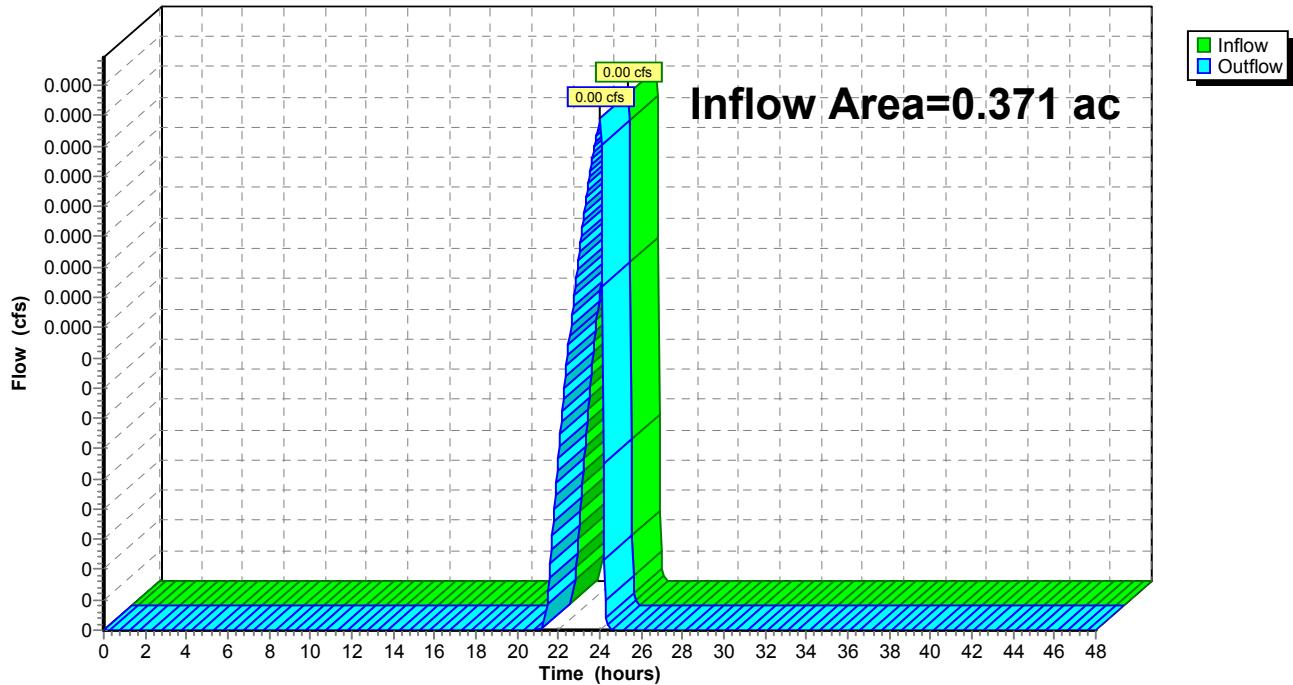
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.371 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
 Inflow = 0.00 cfs @ 23.98 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 23.98 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-2: DP-2

Hydrograph



Summary for Reach DP-3: DP-3

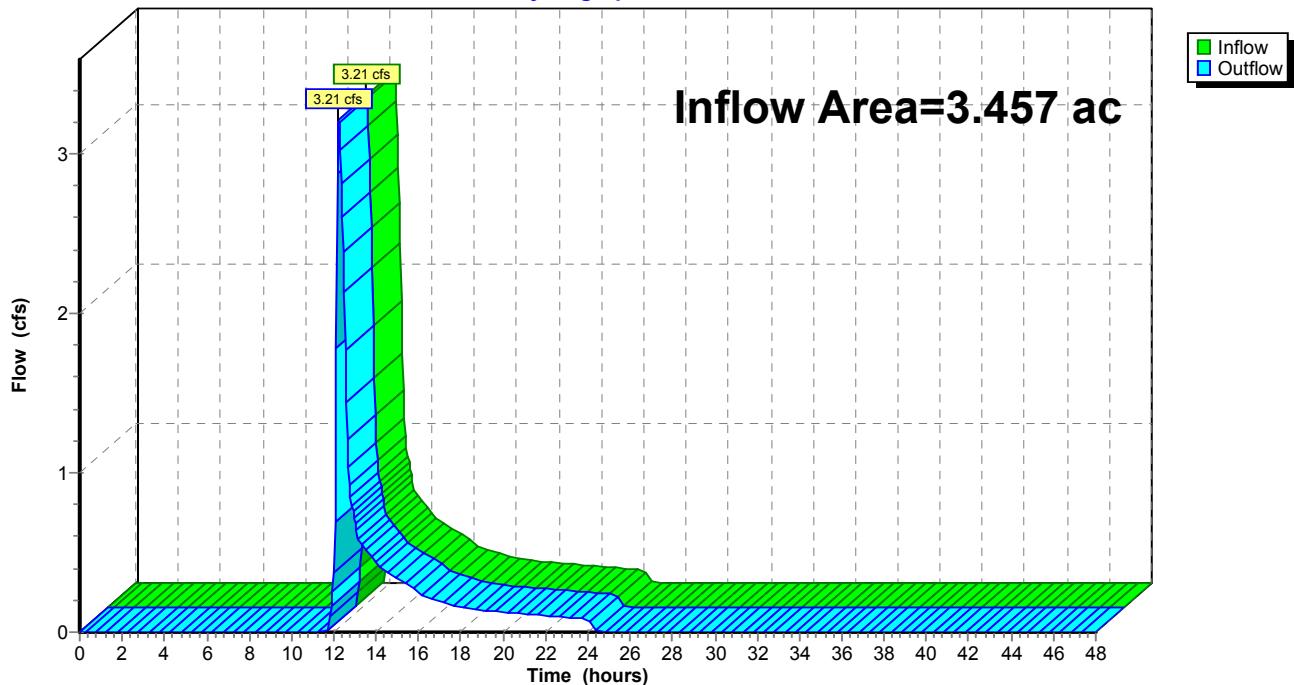
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.457 ac, 30.39% Impervious, Inflow Depth = 1.17" for 10-Year event
 Inflow = 3.21 cfs @ 12.24 hrs, Volume= 0.338 af
 Outflow = 3.21 cfs @ 12.24 hrs, Volume= 0.338 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-3: DP-3

Hydrograph



Summary for Reach DP-4: PL

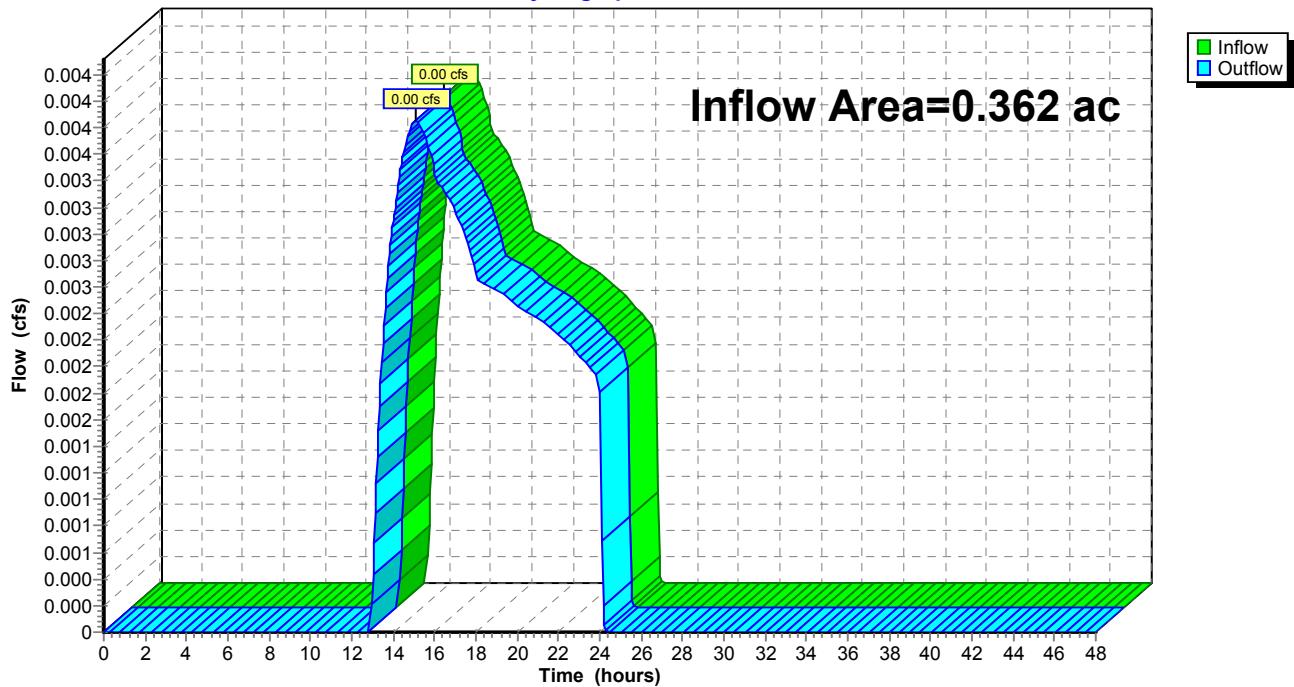
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.362 ac, 0.00% Impervious, Inflow Depth = 0.08" for 10-Year event
 Inflow = 0.00 cfs @ 15.13 hrs, Volume= 0.002 af
 Outflow = 0.00 cfs @ 15.13 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-4: PL

Hydrograph



Summary for Reach DP-5: PL

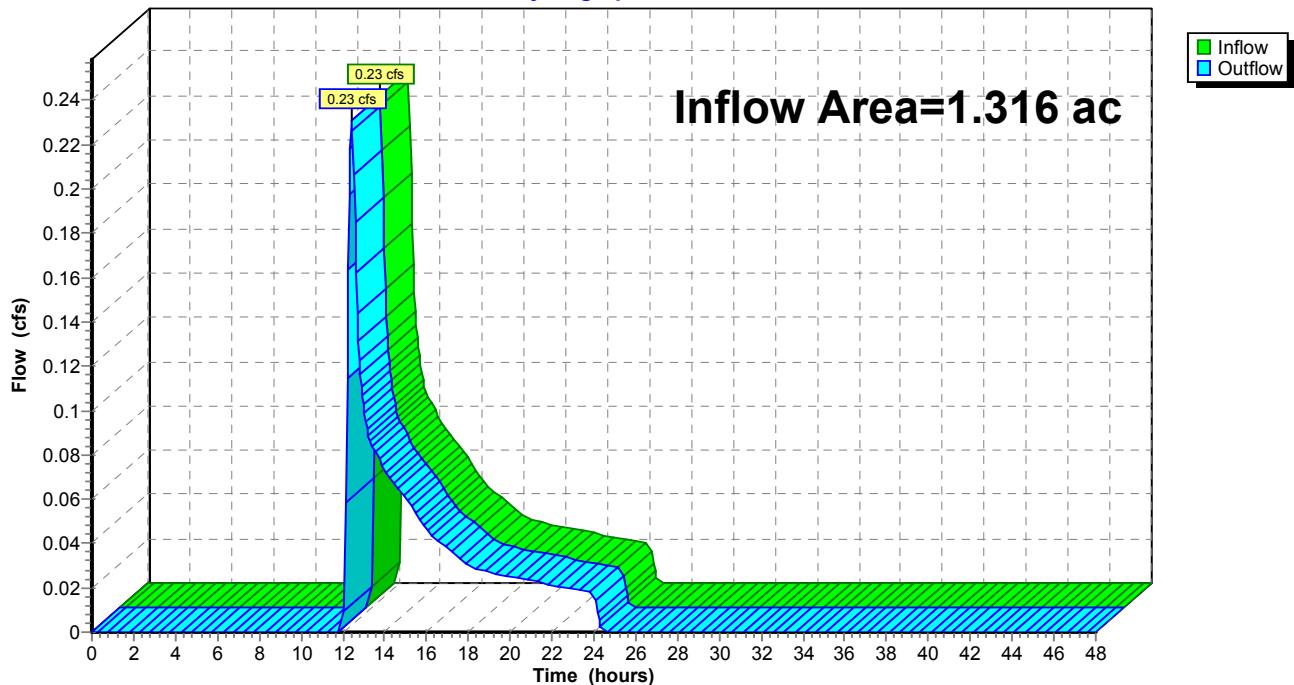
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.316 ac, 14.73% Impervious, Inflow Depth = 0.42" for 10-Year event
 Inflow = 0.23 cfs @ 12.43 hrs, Volume= 0.046 af
 Outflow = 0.23 cfs @ 12.43 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-5: PL

Hydrograph



Summary for Pond D-1: Exist Detention Basin

Inflow Area = 0.720 ac, 0.00% Impervious, Inflow Depth = 0.06" for 10-Year event
 Inflow = 0.01 cfs @ 15.51 hrs, Volume= 0.004 af
 Outflow = 0.01 cfs @ 15.52 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.9 min
 Discarded = 0.01 cfs @ 15.52 hrs, Volume= 0.004 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

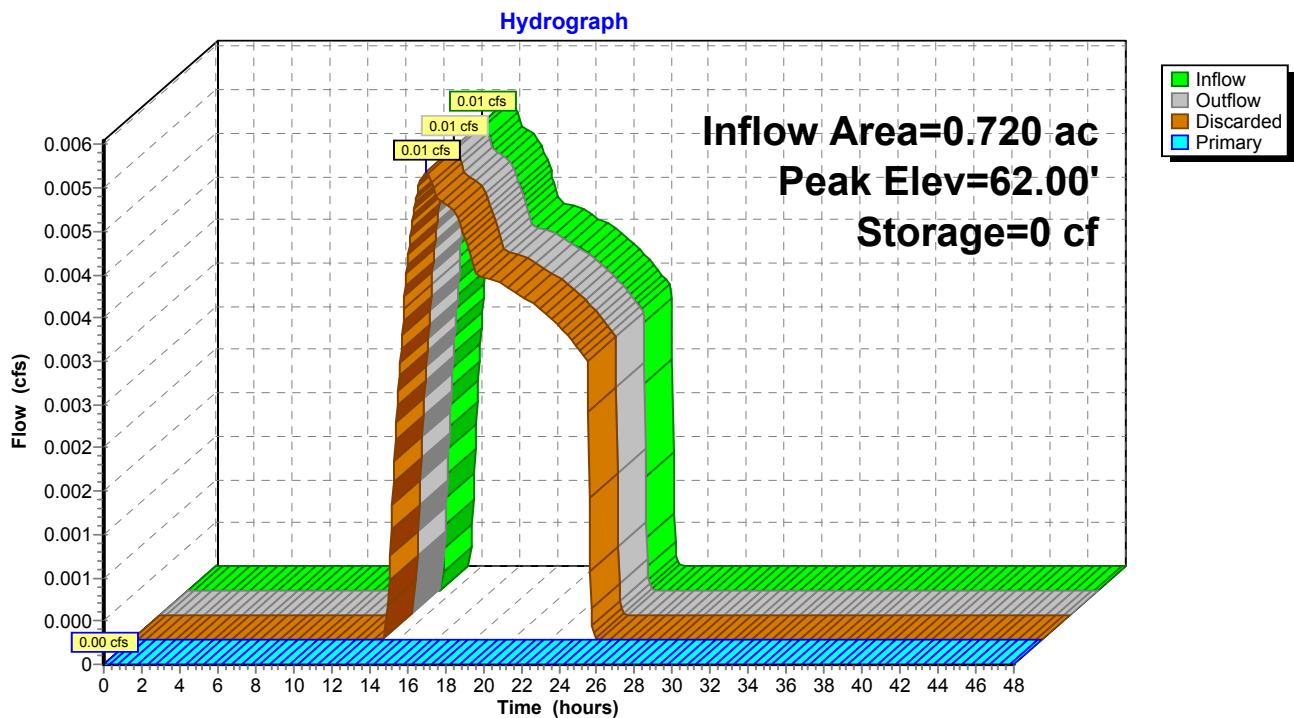
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 62.00' @ 15.52 hrs Surf.Area= 4,336 sf Storage= 0 cf

Plug-Flow detention time= 0.9 min calculated for 0.004 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,120.0 - 1,119.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	62.00'	5,584 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
62.00	4,336	0	0	
63.00	6,832	5,584	5,584	
Device	Routing	Invert	Outlet Devices	
#1	Primary	63.00'	10.0' long x 4.0' breadth Broad-Crested Rectangular Weir	
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00	
			2.50 3.00 3.50 4.00 4.50 5.00 5.50	
			Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66	
			2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32	
#2	Discarded	62.00'	8.270 in/hr Exfiltration over Surface area	Phase-In= 0.01'

Discarded OutFlow Max=0.01 cfs @ 15.52 hrs HW=62.00' (Free Discharge)
 ↑ 2=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.00' TW=0.00' (Dynamic Tailwater)
 ↑ 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond D-1: Exist Detention Basin

Summary for Pond E-DB: Exist Detention Basin

Inflow Area = 1.654 ac, 40.04% Impervious, Inflow Depth = 1.32" for 10-Year event
 Inflow = 2.04 cfs @ 12.15 hrs, Volume= 0.181 af
 Outflow = 1.62 cfs @ 12.25 hrs, Volume= 0.169 af, Atten= 20%, Lag= 5.9 min
 Primary = 1.62 cfs @ 12.25 hrs, Volume= 0.169 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 59.00' @ 12.25 hrs Surf.Area= 1,509 sf Storage= 976 cf

Plug-Flow detention time= 53.4 min calculated for 0.169 af (93% of inflow)
 Center-of-Mass det. time= 17.4 min (892.8 - 875.4)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	7,013 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	445	0	0
59.00	1,511	978	978
60.00	3,286	2,399	3,377
61.00	3,987	3,637	7,013

Device	Routing	Invert	Outlet Devices
#1	Primary	58.12'	12.0" Round RCP_Round 12" L= 25.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 58.12' / 58.05' S= 0.0028 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	58.68'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

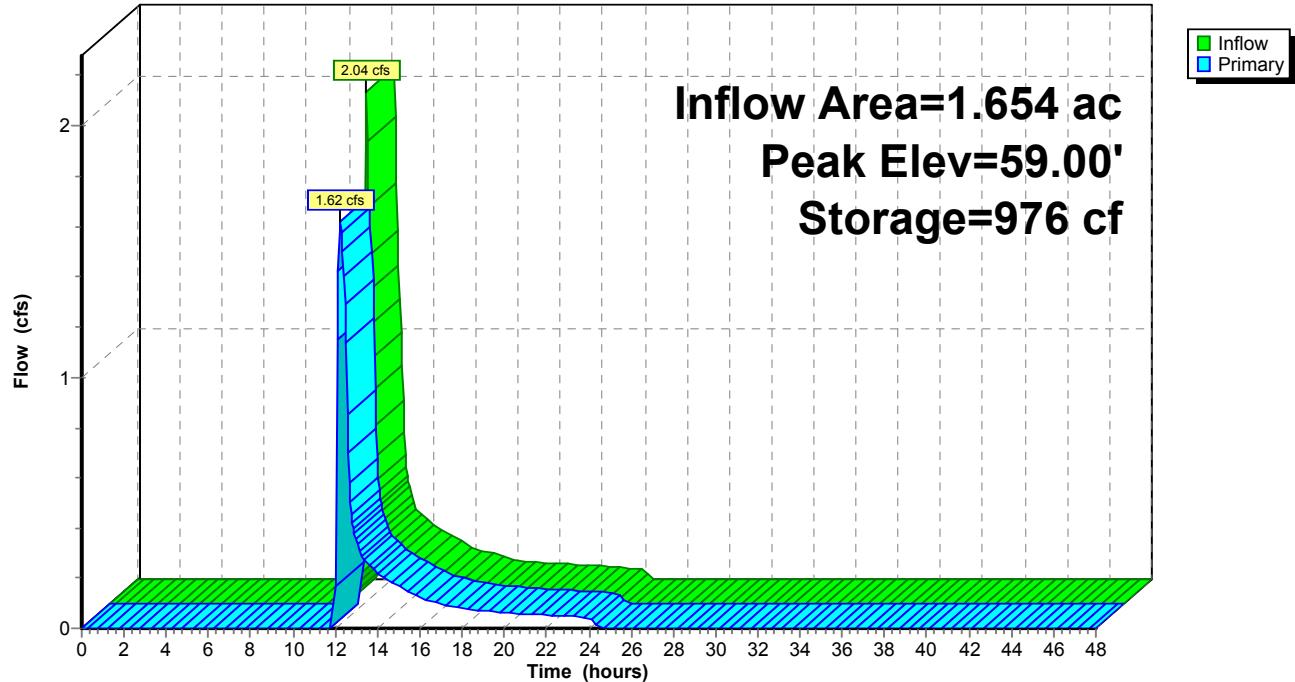
Primary OutFlow Max=1.62 cfs @ 12.25 hrs HW=59.00' TW=56.05' (Dynamic Tailwater)

↑ 1=RCP_Round 12" (Barrel Controls 1.62 cfs @ 2.95 fps)

↑ 2=Sharp-Crested Rectangular Weir(Passes 1.62 cfs of 3.01 cfs potential flow)

Pond E-DB: Exist Detention Basin

Hydrograph



Summary for Pond W1: BVW

Inflow Area = 3.457 ac, 30.39% Impervious, Inflow Depth = 1.17" for 10-Year event
 Inflow = 3.23 cfs @ 12.22 hrs, Volume= 0.338 af
 Outflow = 3.21 cfs @ 12.24 hrs, Volume= 0.338 af, Atten= 1%, Lag= 1.2 min
 Primary = 3.21 cfs @ 12.24 hrs, Volume= 0.338 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 56.05' @ 12.24 hrs Surf.Area= 4,477 sf Storage= 205 cf

Plug-Flow detention time= 1.9 min calculated for 0.337 af (100% of inflow)
 Center-of-Mass det. time= 1.9 min (892.2 - 890.3)

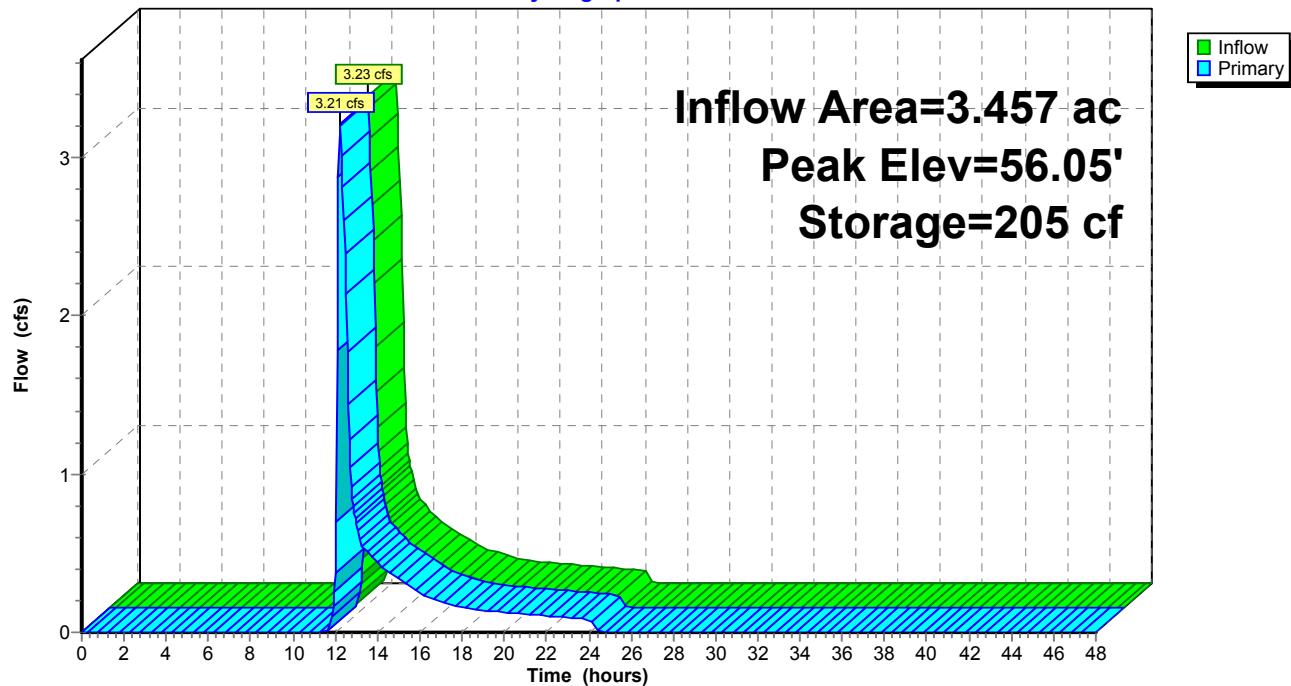
Volume	Invert	Avail.Storage	Storage Description	
#1	56.00'	11,314 cf	Custom Stage Data (Irregular)	Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	3,962	413.1	0	0	3,962
57.00	20,884	797.8	11,314	11,314	41,037

Device	Routing	Invert	Outlet Devices	
#1	Primary	56.00'	120.0' long x 10.0' breadth Broad-Crested Rectangular Weir	

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.18 cfs @ 12.24 hrs HW=56.05' TW=0.00' (Dynamic Tailwater)
 ↑ 1=Broad-Crested Rectangular Weir (Weir Controls 3.18 cfs @ 0.55 fps)

Pond W1: BVW**Hydrograph**

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1A-S: Sub-1A	Runoff Area=12,960 sf 68.56% Impervious Runoff Depth=3.41" Tc=6.0 min CN=79 Runoff=1.16 cfs 0.085 af
Subcatchment1B-S: Sub-1B	Runoff Area=31,377 sf 0.00% Impervious Runoff Depth=0.19" Flow Length=212' Tc=9.6 min CN=35 Runoff=0.02 cfs 0.012 af
Subcatchment1C-S: Sub-1C	Runoff Area=19,404 sf 0.00% Impervious Runoff Depth=0.27" Flow Length=269' Tc=16.6 min CN=37 Runoff=0.03 cfs 0.010 af
Subcatchment1D-S: Sub-1D	Runoff Area=19,501 sf 3.95% Impervious Runoff Depth=0.41" Flow Length=185' Tc=11.0 min CN=40 Runoff=0.07 cfs 0.015 af
Subcatchment2S: Sub-2	Runoff Area=16,140 sf 0.00% Impervious Runoff Depth=0.04" Flow Length=164' Tc=8.6 min CN=30 Runoff=0.00 cfs 0.001 af
Subcatchment3A-S: Sub-3A	Runoff Area=72,040 sf 40.04% Impervious Runoff Depth=1.89" Flow Length=534' Tc=9.4 min CN=62 Runoff=3.05 cfs 0.260 af
Subcatchment3B-S: Sub-3B	Runoff Area=78,565 sf 21.55% Impervious Runoff Depth=1.65" Flow Length=552' Tc=12.4 min CN=59 Runoff=2.57 cfs 0.248 af
Subcatchment4S: Sub-4	Runoff Area=15,787 sf 0.00% Impervious Runoff Depth=0.23" Tc=6.0 min CN=36 Runoff=0.02 cfs 0.007 af
Subcatchment5S: Sub-5	Runoff Area=57,338 sf 14.73% Impervious Runoff Depth=0.74" Flow Length=438' Tc=14.0 min CN=46 Runoff=0.53 cfs 0.082 af
Reach DP-1: DP-1	Inflow=1.17 cfs 0.110 af Outflow=1.17 cfs 0.110 af
Reach DP-2: DP-2	Inflow=0.00 cfs 0.001 af Outflow=0.00 cfs 0.001 af
Reach DP-3: DP-3	Inflow=4.79 cfs 0.496 af Outflow=4.79 cfs 0.496 af
Reach DP-4: PL	Inflow=0.02 cfs 0.007 af Outflow=0.02 cfs 0.007 af
Reach DP-5: PL	Inflow=0.53 cfs 0.082 af Outflow=0.53 cfs 0.082 af
Pond D-1: Exist Detention Basin	Peak Elev=62.00' Storage=1 cf Inflow=0.02 cfs 0.012 af Discarded=0.02 cfs 0.012 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.012 af
Pond E-DB: Exist Detention Basin	Peak Elev=59.23' Storage=1,373 cf Inflow=3.05 cfs 0.260 af Outflow=2.28 cfs 0.248 af

27-135 Pre-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

*Type III 24-hr 25-Year Rainfall=5.70"*Page 58**Pond W1: BVW**Peak Elev=56.06' Storage=273 cf Inflow=4.79 cfs 0.496 af
Outflow=4.79 cfs 0.496 af**Total Runoff Area = 7.418 ac Runoff Volume = 0.720 af Average Runoff Depth = 1.16"
80.23% Pervious = 5.951 ac 19.77% Impervious = 1.466 ac**

Summary for Subcatchment 1A-S: Sub-1A

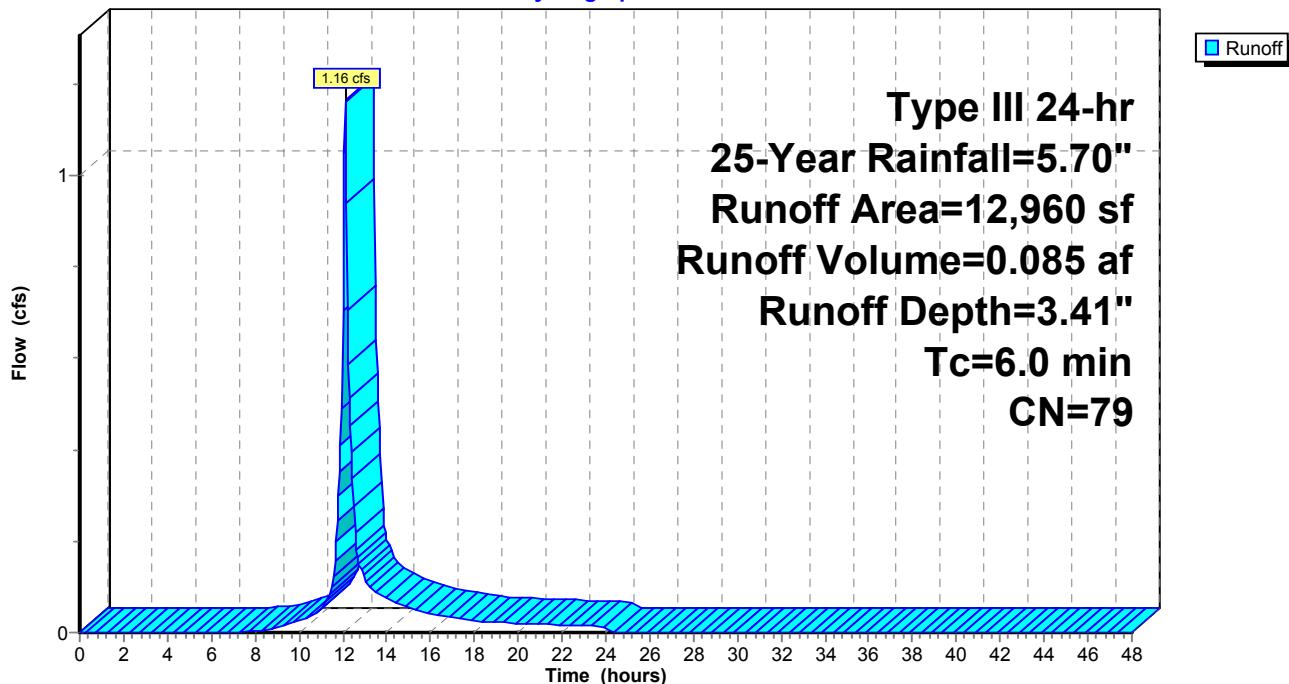
Runoff = 1.16 cfs @ 12.09 hrs, Volume= 0.085 af, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description			
4,075	39	>75% Grass cover, Good, HSG A			
8,885	98	Paved roads w/curbs & sewers, HSG A			
12,960	79	Weighted Average			
4,075		31.44% Pervious Area			
8,885		68.56% Impervious Area			
Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1A-S: Sub-1A

Hydrograph



Summary for Subcatchment 1B-S: Sub-1B

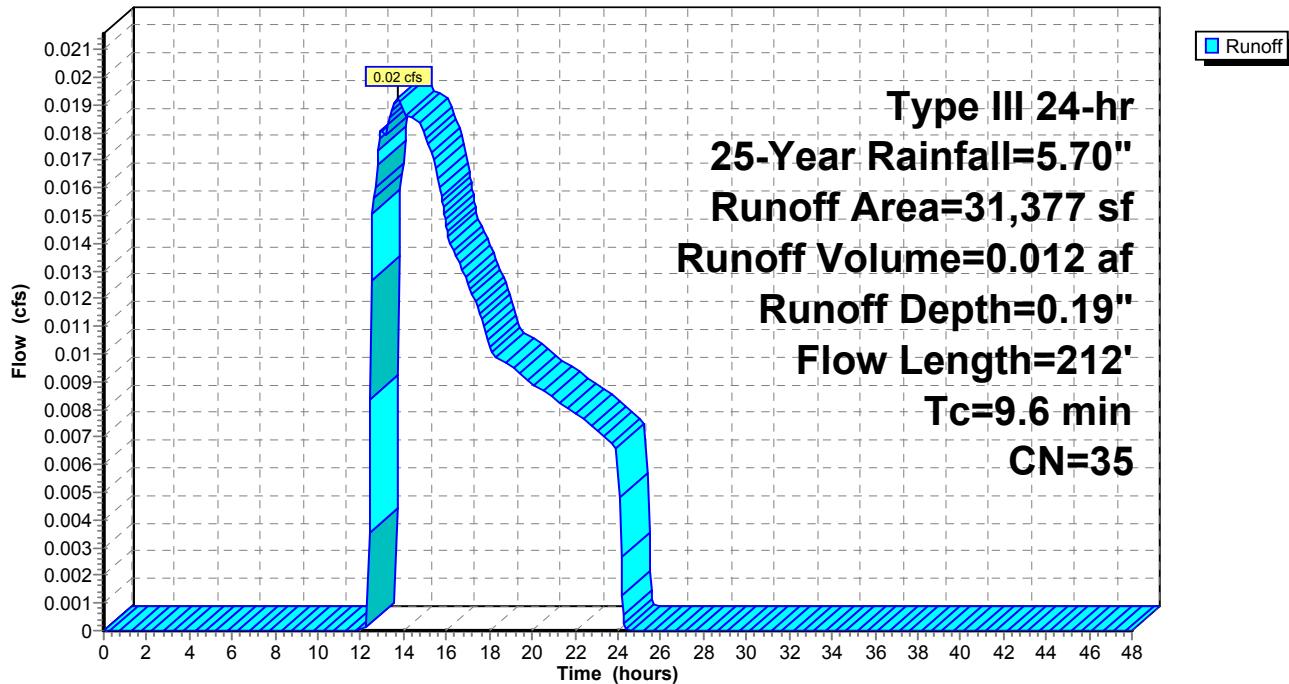
Runoff = 0.02 cfs @ 13.73 hrs, Volume= 0.012 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description			
22,072	30	Woods, Good, HSG A			
1,755	39	>75% Grass cover, Good, HSG A			
7,550	49	50-75% Grass cover, Fair, HSG A			
31,377	35	Weighted Average			
31,377		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.60"
1.5	162	0.0120	1.76		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.6	212				Total

Subcatchment 1B-S: Sub-1B

Hydrograph



Summary for Subcatchment 1C-S: Sub-1C

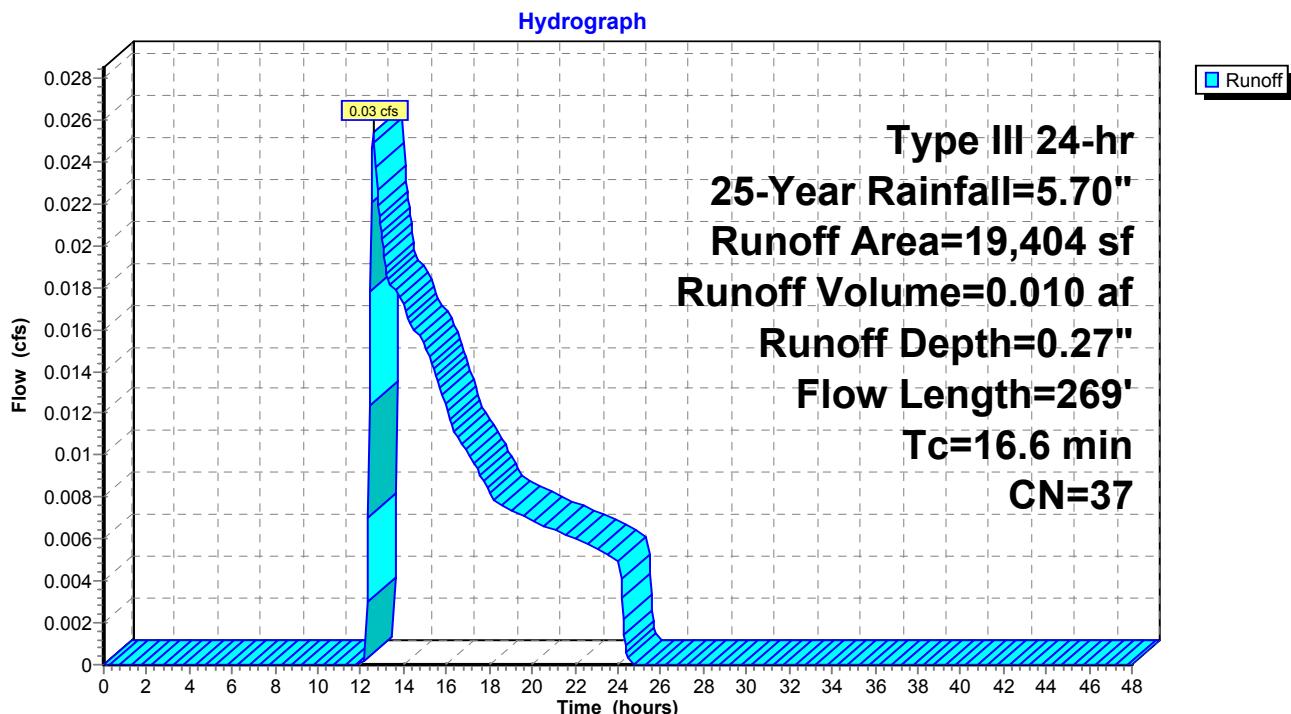
Runoff = 0.03 cfs @ 12.60 hrs, Volume= 0.010 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
*	12,129	30 Woods, Good, HSG A
	1,513	>75% Grass cover, Good, HSG A
	3,840	Woods, Good, HSG B
	899	Woods, Good, HSG A - offsite
	1,023	50-75% Grass cover, Fair, HSG A
19,404	37	Weighted Average
19,404		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	50	0.0120	0.06		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
2.3	219	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
16.6	269	Total			

Subcatchment 1C-S: Sub-1C



Summary for Subcatchment 1D-S: Sub-1D

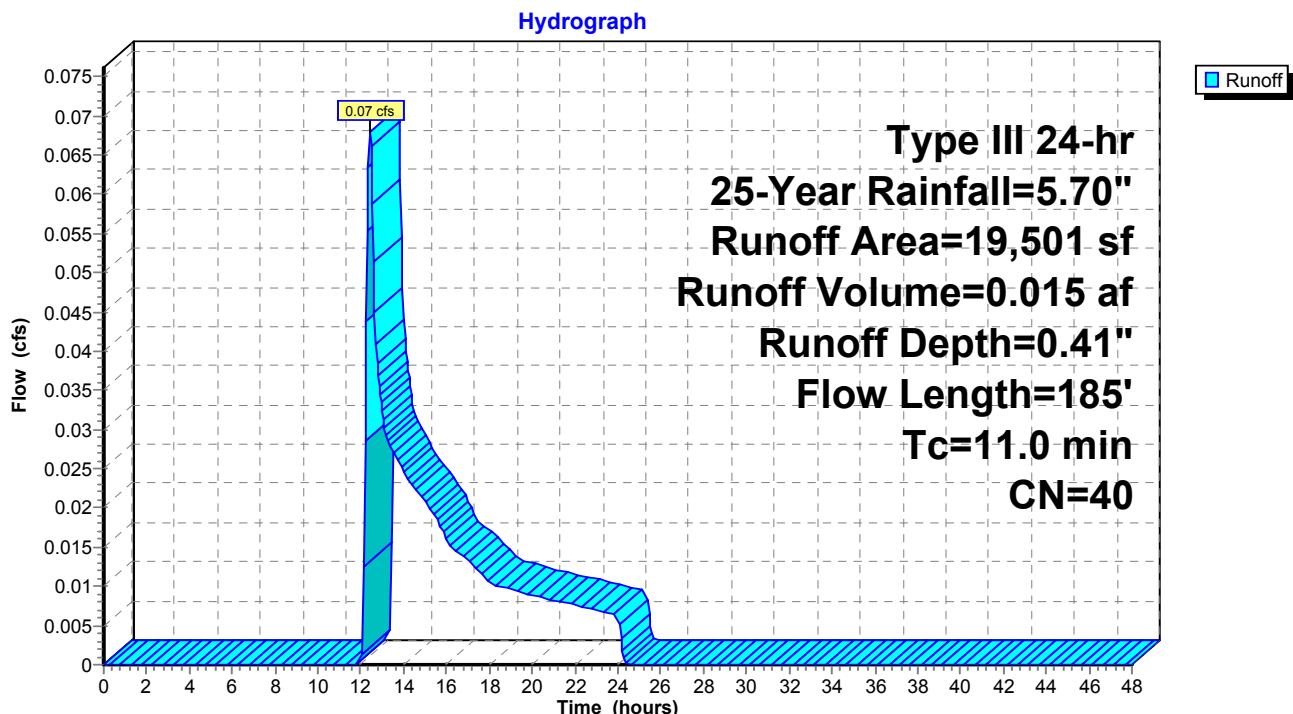
Runoff = 0.07 cfs @ 12.43 hrs, Volume= 0.015 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
10,890	39	>75% Grass cover, Good, HSG A
2,684	49	50-75% Grass cover, Fair, HSG A
*	98	Rubble Pile, HSG A
	30	Woods, Good, HSG A
	40	Weighted Average
		96.05% Pervious Area
5,157		3.95% Impervious Area
19,501		
18,731		
770		

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0300	0.08		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
1.1	135	0.0160	2.04		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
11.0	185	Total			

Subcatchment 1D-S: Sub-1D



Summary for Subcatchment 2S: Sub-2

Runoff = 0.00 cfs @ 17.04 hrs, Volume= 0.001 af, Depth= 0.04"

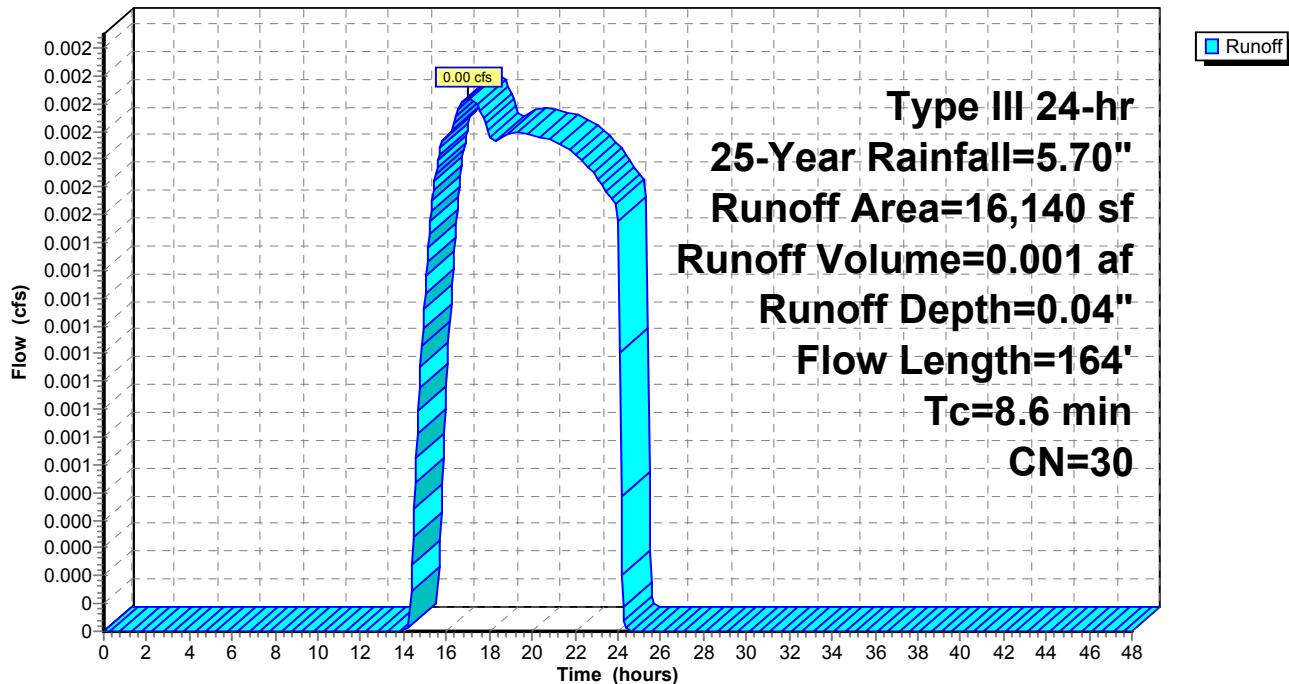
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
16,140	30	Woods, Good, HSG A
16,140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	50	0.0800	0.12		Sheet Flow, A-B
1.9	114	0.0383	0.98		Shallow Concentrated Flow, B-C
8.6	164				Total

Subcatchment 2S: Sub-2

Hydrograph



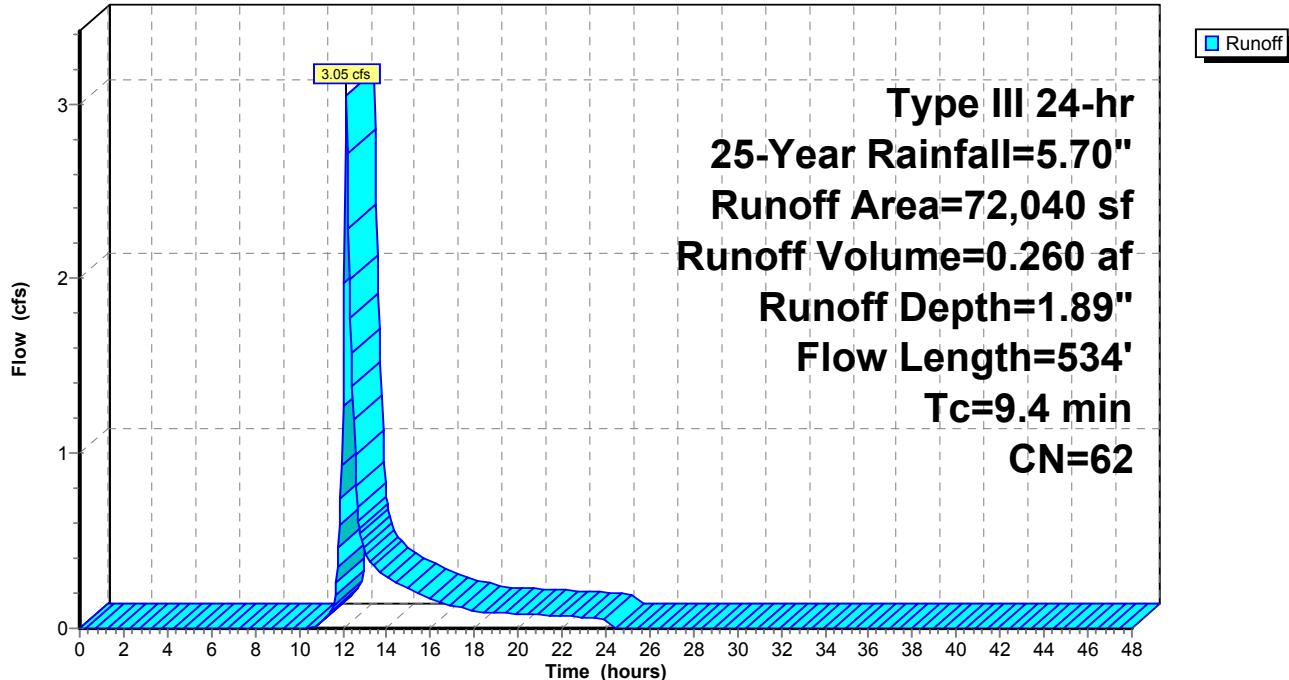
Summary for Subcatchment 3A-S: Sub-3A

Runoff = 3.05 cfs @ 12.15 hrs, Volume= 0.260 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
*	1,384	98 Roofs, HSG A - offsite
*	16,069	98 Paved parking, HSG A - offsite
*	1,682	30 Woods, Good, HSG A - offsite
*	914	>75% Grass cover, Good, HSG A - offsite
24,471	30	Woods, Good, HSG A
6,905	39	>75% Grass cover, Good, HSG A
2,407	98	Paved roads w/curbs & sewers, HSG A
*	2,712	98 Existing Detention Basin, HSG A
*	810	Riprap, HSG A
3,247	98	Paved roads w/curbs & sewers, HSG B
2,784	55	Woods, Good, HSG B
*	938	Riprap, HSG B
6,442	61	>75% Grass cover, Good, HSG B
*	1,275	98 Existing Detention Basin, HSG B
72,040	62	Weighted Average
43,198		59.96% Pervious Area
28,842		40.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.0160	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
1.8	225	0.0160	2.04		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.9	102	0.0090	1.93		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	157	0.0030	2.88	3.54	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
9.4	534	Total			

Subcatchment 3A-S: Sub-3A**Hydrograph**

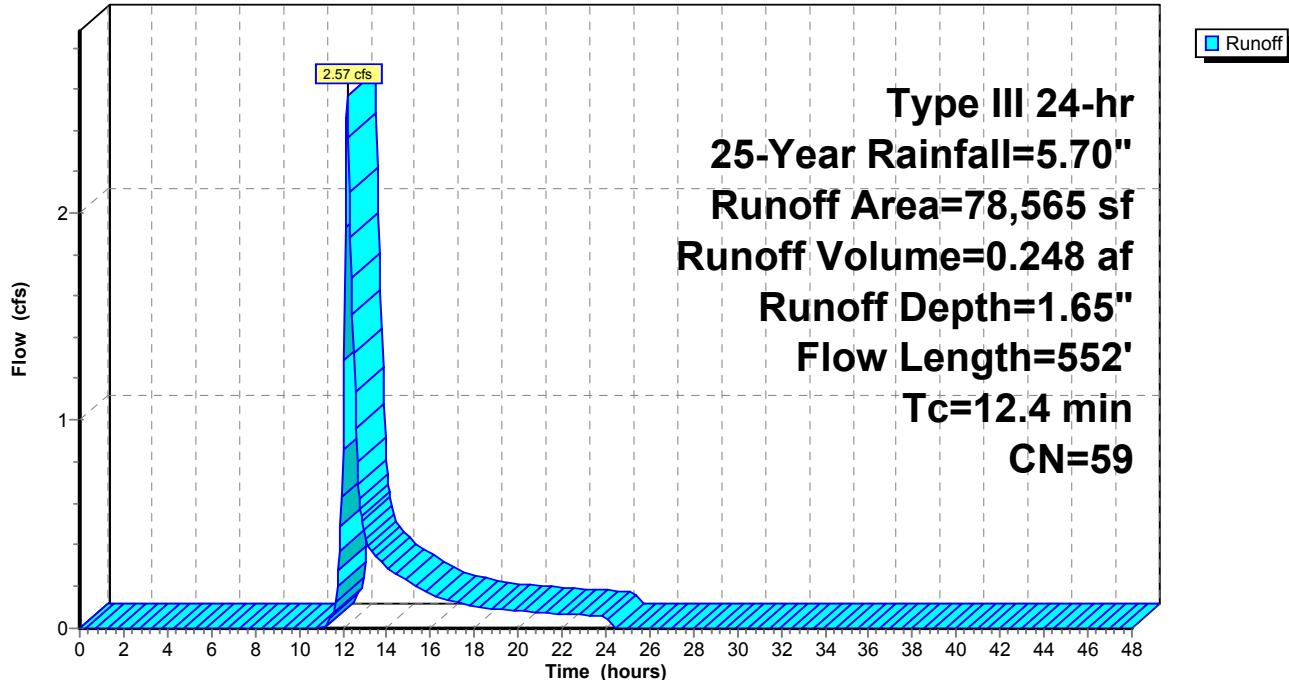
Summary for Subcatchment 3B-S: Sub-3B

Runoff = 2.57 cfs @ 12.19 hrs, Volume= 0.248 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=5.70"

	Area (sf)	CN	Description
*	285	98	Riprap, HSG A
*	121	98	Riprap, HSG B
	9,681	30	Woods, Good, HSG A
	30,788	55	Woods, Good, HSG B
	1,762	39	>75% Grass cover, Good, HSG A
	8,282	61	>75% Grass cover, Good, HSG B
*	15,816	98	Wetlands, HSG B
*	4,310	30	Woods, Good, HSG A - offsite
*	418	98	Wetlands, HSG B - offsite
*	4,121	39	>75% Grass cover, Good, HSG A - offsite
*	290	98	Paved drive, HSG A - offsite
*	957	61	>75% Grass cover, Good, HSG B - offsite
*	1,734	55	Woods, Good, HSG B - offsite
	78,565	59	Weighted Average
	61,635		78.45% Pervious Area
	16,930		21.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0700	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.60"
1.5	294	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.9	208	0.0030	0.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
12.4	552	Total			

Subcatchment 3B-S: Sub-3B**Hydrograph**

Summary for Subcatchment 4S: Sub-4

Runoff = 0.02 cfs @ 12.47 hrs, Volume= 0.007 af, Depth= 0.23"

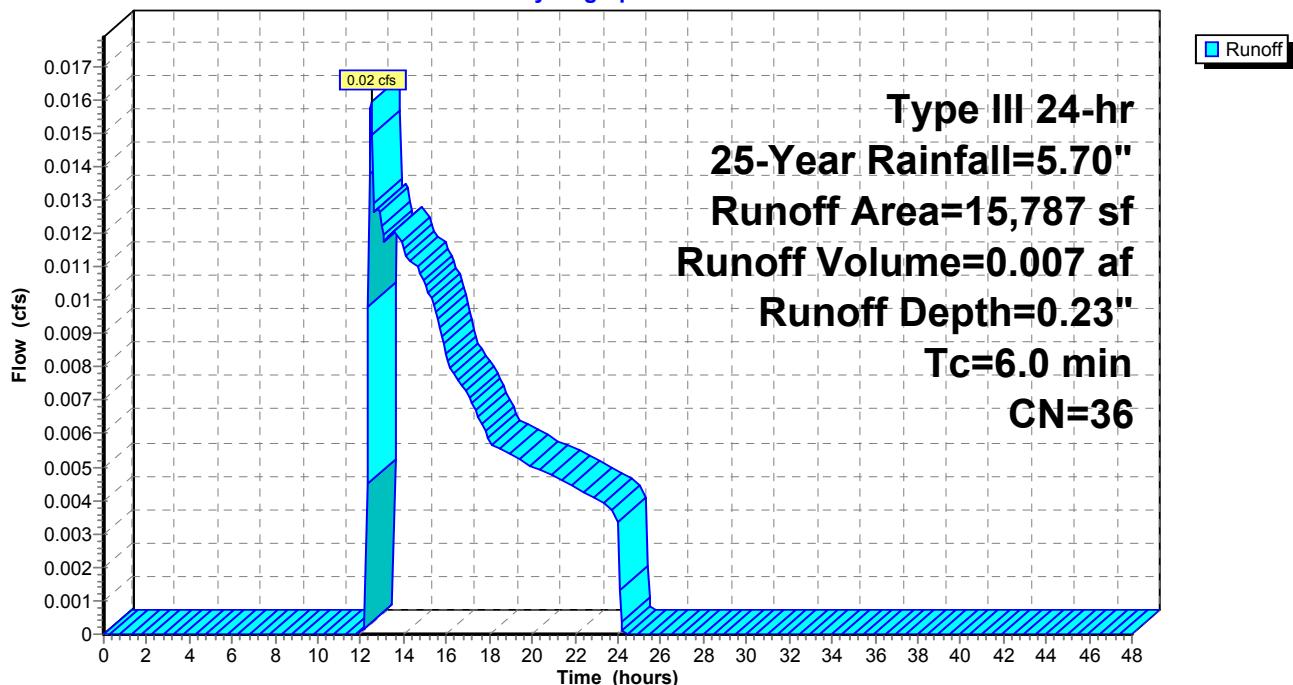
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
15,787	36	Woods, Fair, HSG A
15,787		100.00% Pervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 4S: Sub-4

Hydrograph



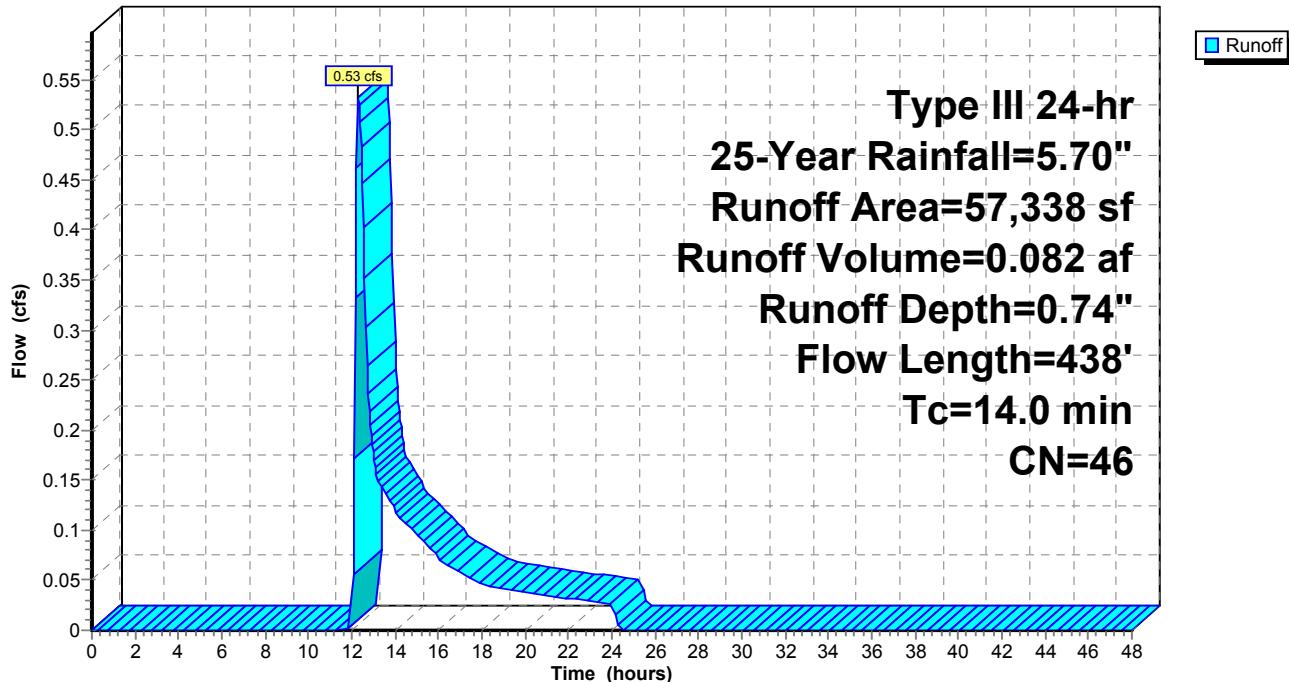
Summary for Subcatchment 5S: Sub-5

Runoff = 0.53 cfs @ 12.30 hrs, Volume= 0.082 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
32,867	36	Woods, Fair, HSG A
15,631	39	>75% Grass cover, Good, HSG A
395	80	>75% Grass cover, Good, HSG D
*	293	Paved drive, HSG D
2,148	98	Roofs, HSG A
*	5,236	Paved drive, HSG A
*	533	Patio, HSG A
*	235	Misc, HSG A
57,338	46	Weighted Average
48,893		85.27% Pervious Area
8,445		14.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	39	0.1538	0.15		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
1.8	11	0.1100	0.10		Sheet Flow, B-C Woods: Light underbrush n= 0.400 P2= 3.60"
0.2	22	0.1166	1.71		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
0.9	54	0.0370	0.96		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
0.6	52	0.0770	1.39		Shallow Concentrated Flow, E-F Woodland Kv= 5.0 fps
5.5	175	0.0114	0.53		Shallow Concentrated Flow, F-G Woodland Kv= 5.0 fps
0.8	85	0.1176	1.71		Shallow Concentrated Flow, G-H Woodland Kv= 5.0 fps
14.0	438	Total			

Subcatchment 5S: Sub-5**Hydrograph**

Summary for Reach DP-1: DP-1

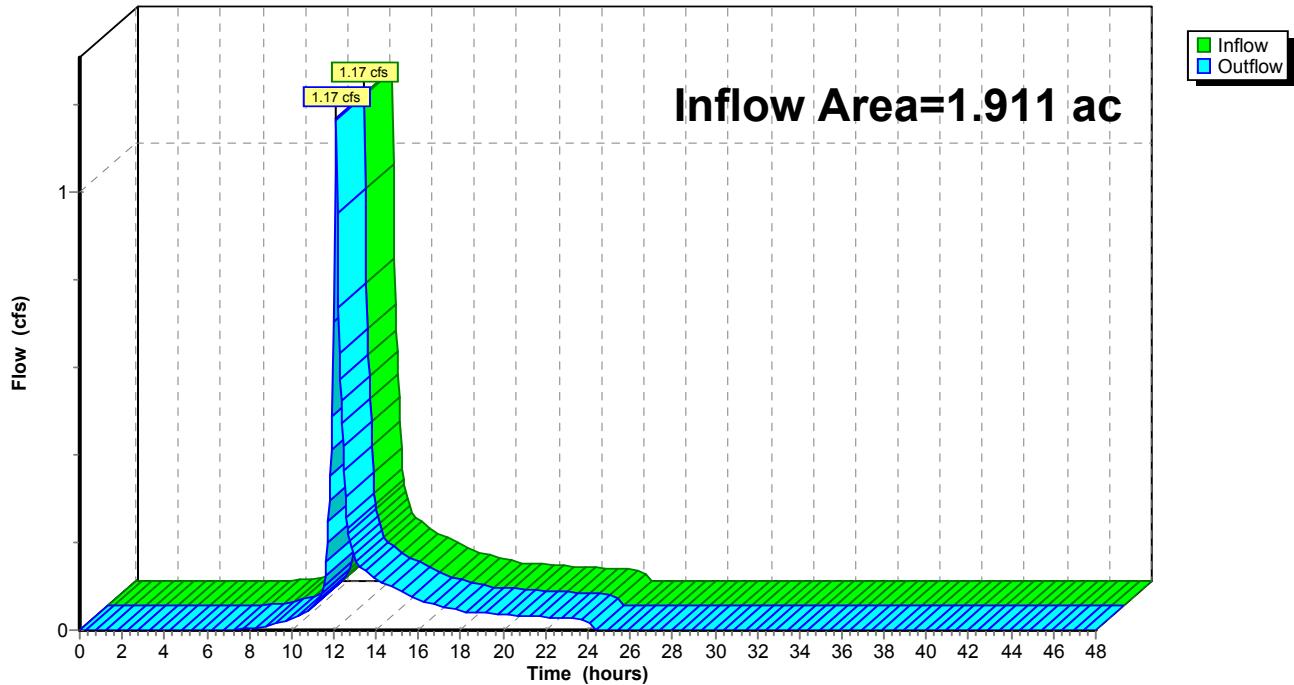
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.911 ac, 11.60% Impervious, Inflow Depth = 0.69" for 25-Year event
 Inflow = 1.17 cfs @ 12.09 hrs, Volume= 0.110 af
 Outflow = 1.17 cfs @ 12.09 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-1: DP-1

Hydrograph



Summary for Reach DP-2: DP-2

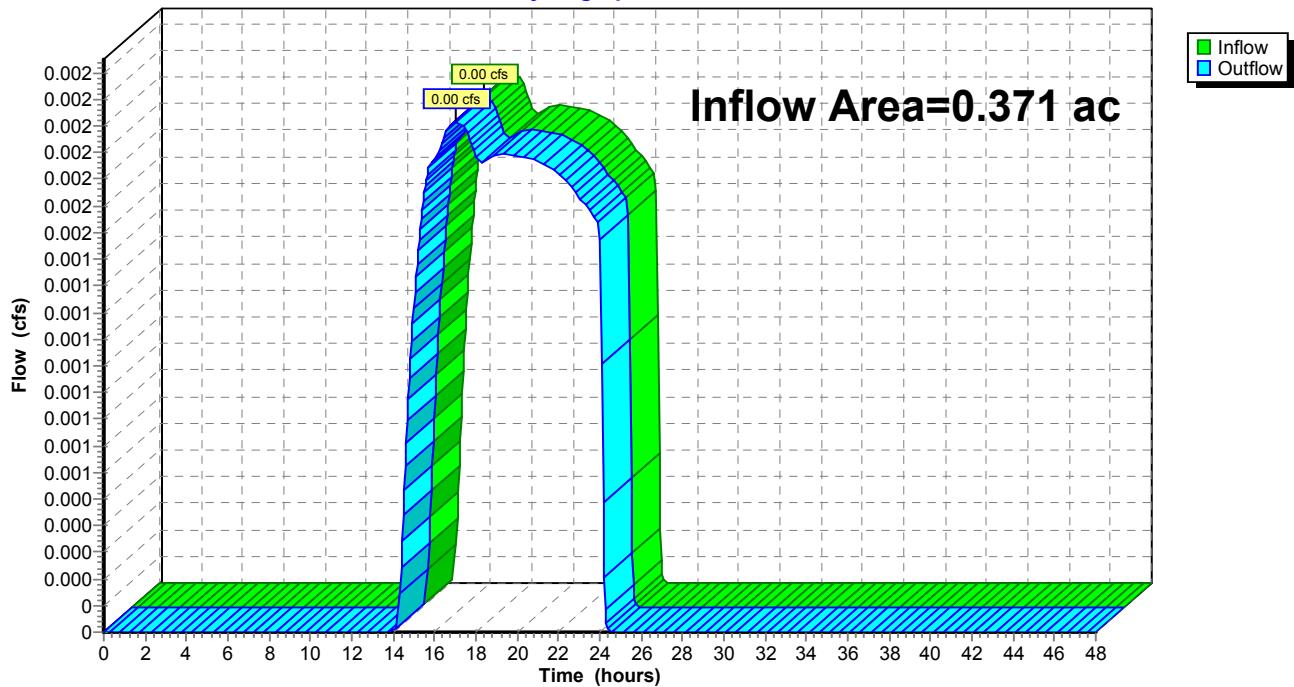
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.371 ac, 0.00% Impervious, Inflow Depth = 0.04" for 25-Year event
 Inflow = 0.00 cfs @ 17.04 hrs, Volume= 0.001 af
 Outflow = 0.00 cfs @ 17.04 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-2: DP-2

Hydrograph



Summary for Reach DP-3: DP-3

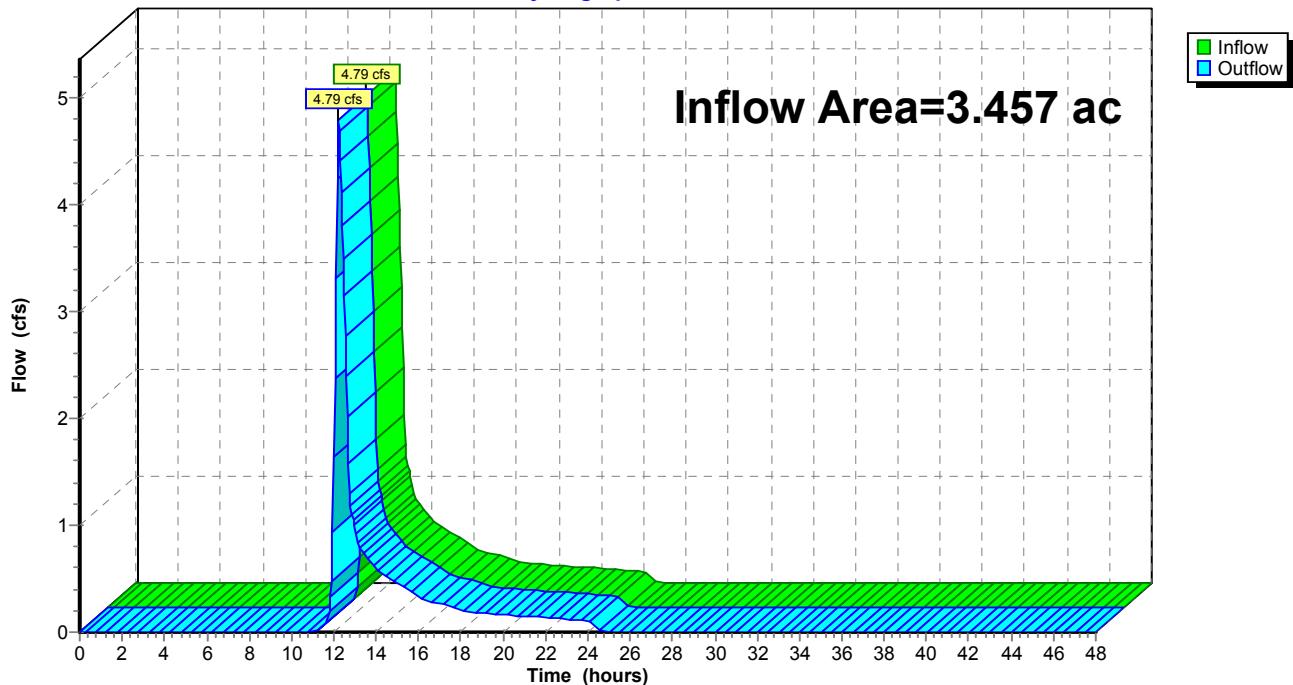
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.457 ac, 30.39% Impervious, Inflow Depth = 1.72" for 25-Year event
 Inflow = 4.79 cfs @ 12.22 hrs, Volume= 0.496 af
 Outflow = 4.79 cfs @ 12.22 hrs, Volume= 0.496 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-3: DP-3

Hydrograph



Summary for Reach DP-4: PL

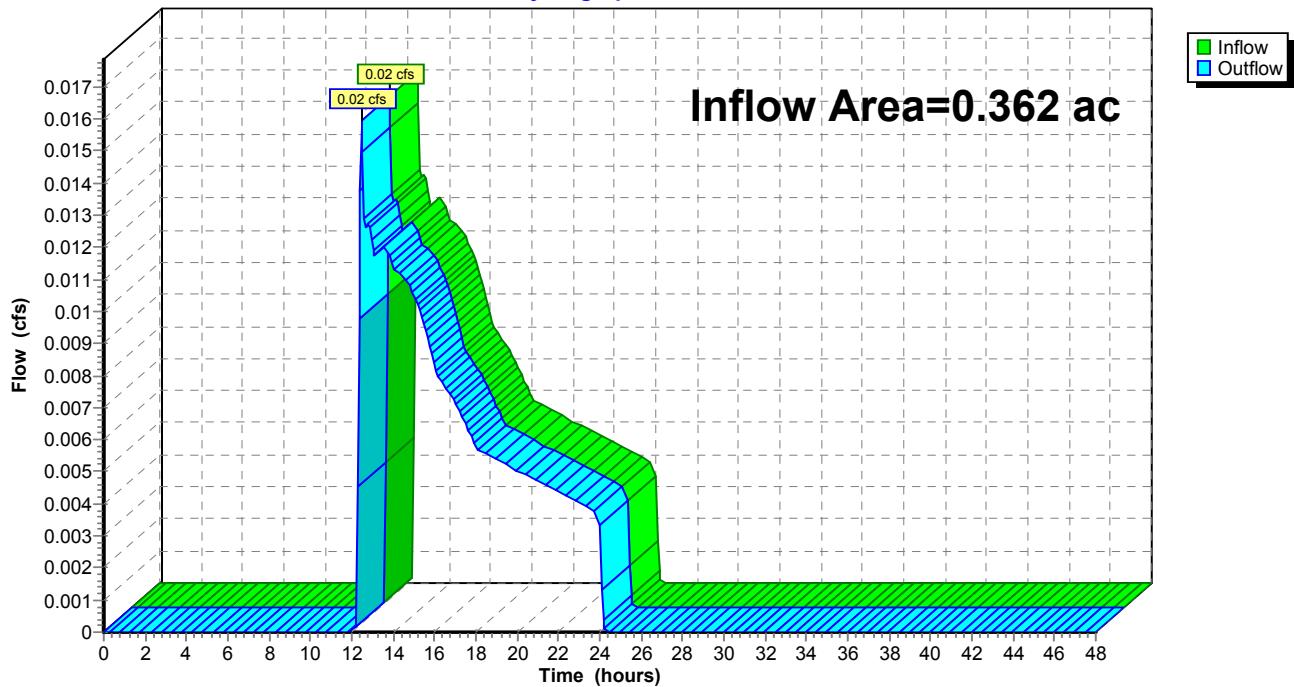
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.362 ac, 0.00% Impervious, Inflow Depth = 0.23" for 25-Year event
 Inflow = 0.02 cfs @ 12.47 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 12.47 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-4: PL

Hydrograph



Summary for Reach DP-5: PL

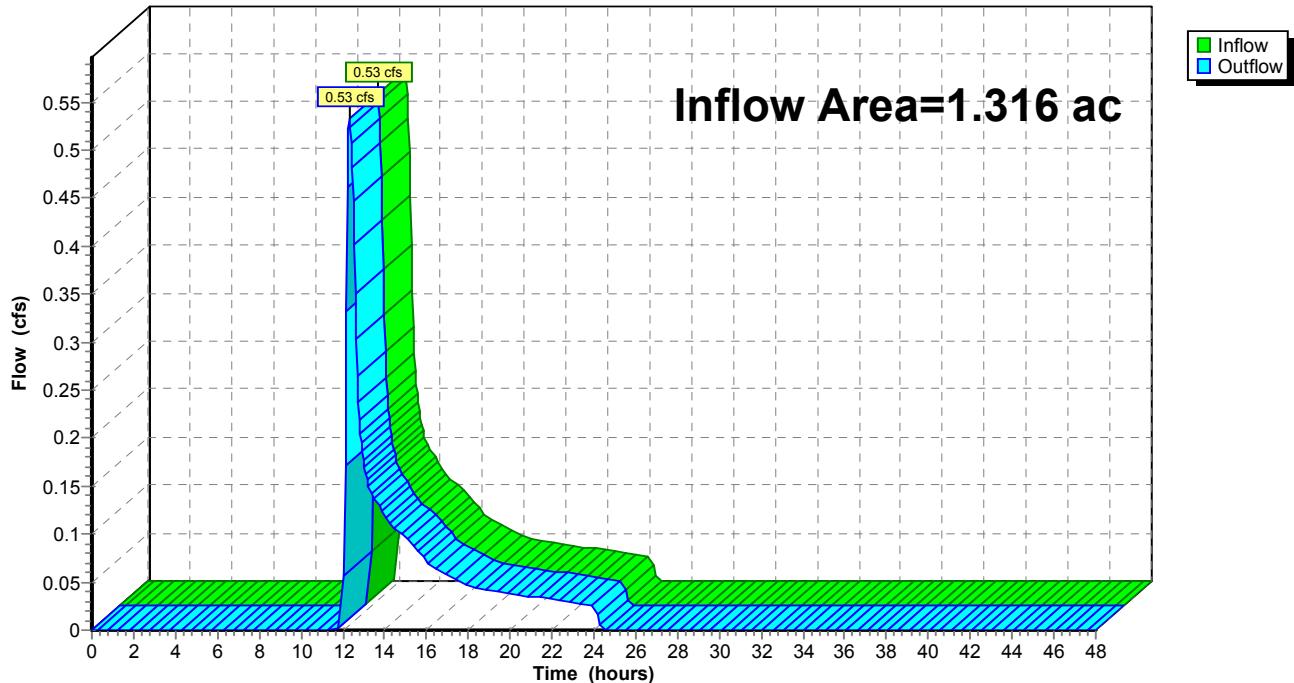
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.316 ac, 14.73% Impervious, Inflow Depth = 0.74" for 25-Year event
 Inflow = 0.53 cfs @ 12.30 hrs, Volume= 0.082 af
 Outflow = 0.53 cfs @ 12.30 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-5: PL

Hydrograph



Summary for Pond D-1: Exist Detention Basin

Inflow Area = 0.720 ac, 0.00% Impervious, Inflow Depth = 0.19" for 25-Year event
 Inflow = 0.02 cfs @ 13.73 hrs, Volume= 0.012 af
 Outflow = 0.02 cfs @ 13.75 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.8 min
 Discarded = 0.02 cfs @ 13.75 hrs, Volume= 0.012 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

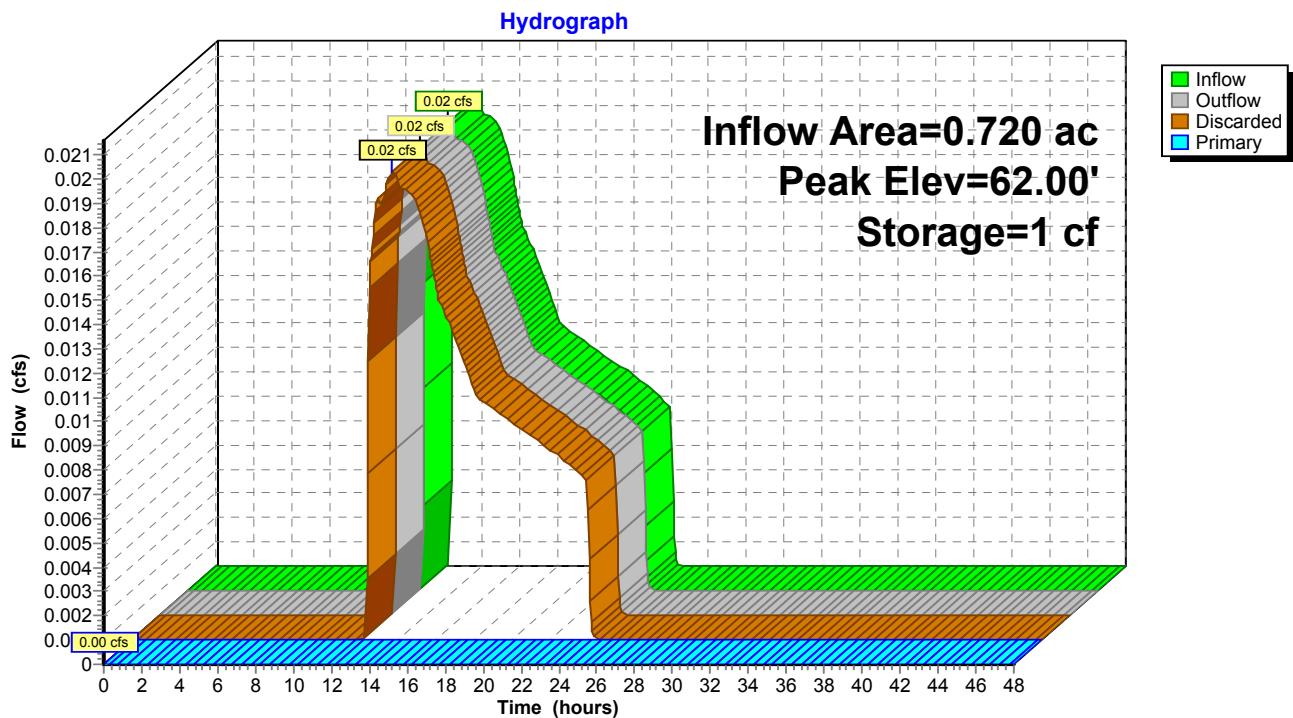
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 62.00' @ 13.75 hrs Surf.Area= 4,337 sf Storage= 1 cf

Plug-Flow detention time= 0.9 min calculated for 0.012 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,029.7 - 1,028.9)

Volume	Invert	Avail.Storage	Storage Description	
#1	62.00'	5,584 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
62.00	4,336	0	0	
63.00	6,832	5,584	5,584	
Device	Routing	Invert	Outlet Devices	
#1	Primary	63.00'	10.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32	
#2	Discarded	62.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'	

Discarded OutFlow Max=0.02 cfs @ 13.75 hrs HW=62.00' (Free Discharge)
 ↑ 2=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.00' TW=0.00' (Dynamic Tailwater)
 ↑ 1=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond D-1: Exist Detention Basin

Summary for Pond E-DB: Exist Detention Basin

Inflow Area = 1.654 ac, 40.04% Impervious, Inflow Depth = 1.89" for 25-Year event
 Inflow = 3.05 cfs @ 12.15 hrs, Volume= 0.260 af
 Outflow = 2.28 cfs @ 12.26 hrs, Volume= 0.248 af, Atten= 25%, Lag= 6.7 min
 Primary = 2.28 cfs @ 12.26 hrs, Volume= 0.248 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 59.23' @ 12.26 hrs Surf.Area= 1,920 sf Storage= 1,373 cf

Plug-Flow detention time= 40.2 min calculated for 0.248 af (95% of inflow)
 Center-of-Mass det. time= 13.8 min (877.7 - 863.9)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	7,013 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

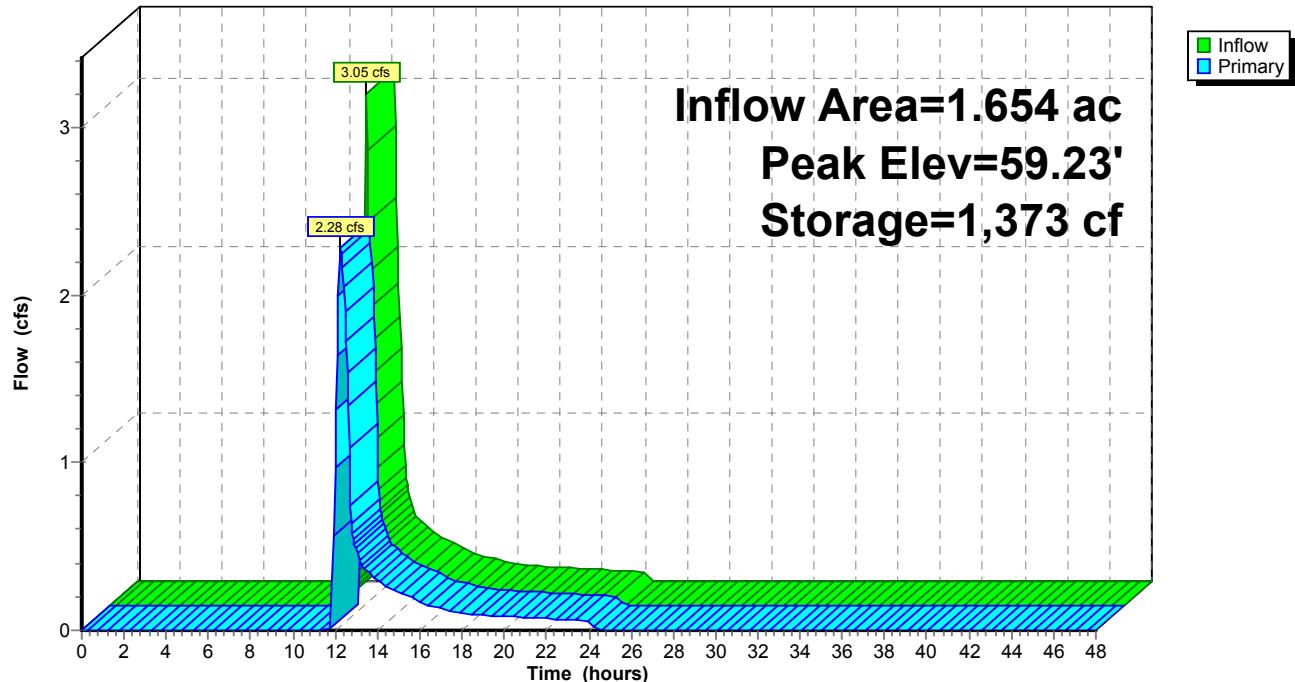
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	445	0	0
59.00	1,511	978	978
60.00	3,286	2,399	3,377
61.00	3,987	3,637	7,013

Device	Routing	Invert	Outlet Devices
#1	Primary	58.12'	12.0" Round RCP_Round 12" L= 25.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 58.12' / 58.05' S= 0.0028 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	58.68'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=2.27 cfs @ 12.26 hrs HW=59.23' TW=56.06' (Dynamic Tailwater)

↑ 1=RCP_Round 12" (Barrel Controls 2.27 cfs @ 3.26 fps)

↑ 2=Sharp-Crested Rectangular Weir(Passes 2.27 cfs of 6.92 cfs potential flow)

Pond E-DB: Exist Detention Basin**Hydrograph**

Summary for Pond W1: BVW

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 3.457 ac, 30.39% Impervious, Inflow Depth = 1.72" for 25-Year event
 Inflow = 4.79 cfs @ 12.21 hrs, Volume= 0.496 af
 Outflow = 4.79 cfs @ 12.22 hrs, Volume= 0.496 af, Atten= 0%, Lag= 0.6 min
 Primary = 4.79 cfs @ 12.22 hrs, Volume= 0.496 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 56.06' @ 12.22 hrs Surf.Area= 4,642 sf Storage= 273 cf

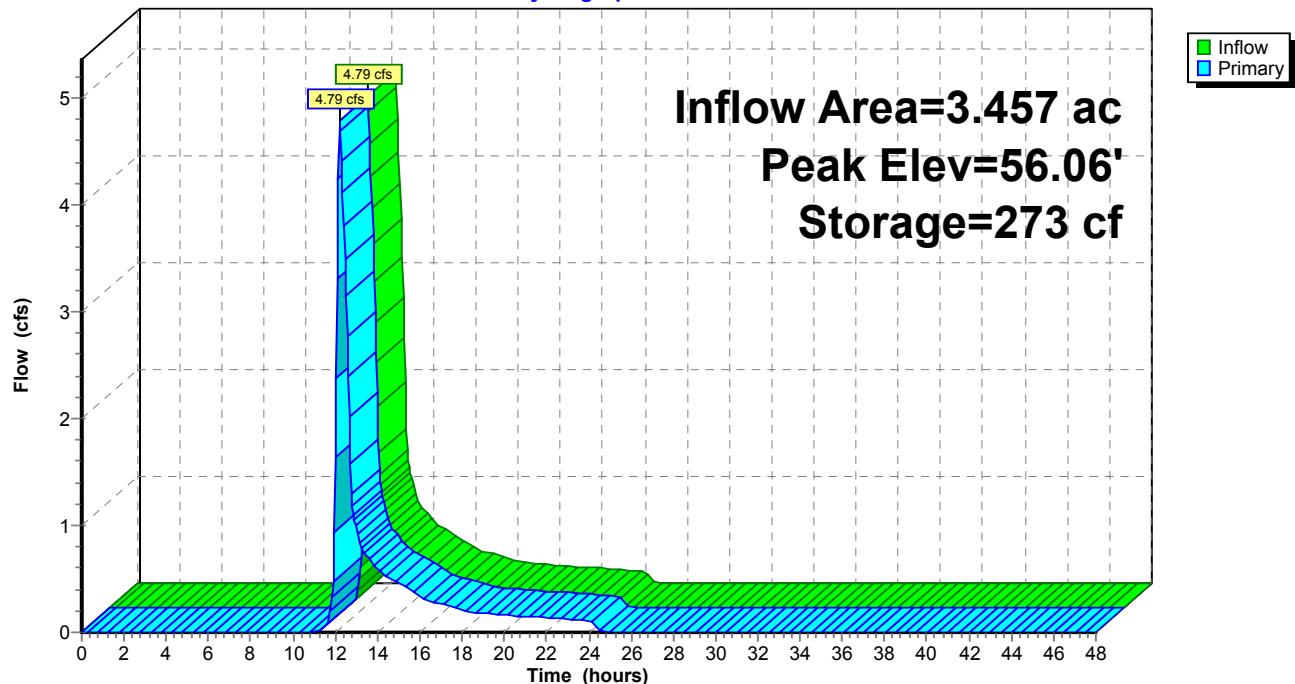
Plug-Flow detention time= 1.7 min calculated for 0.495 af (100% of inflow)
 Center-of-Mass det. time= 1.7 min (878.0 - 876.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	56.00'	11,314 cf	Custom Stage Data (Irregular)	Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	3,962	413.1	0	0	3,962
57.00	20,884	797.8	11,314	11,314	41,037

Device	Routing	Invert	Outlet Devices
#1	Primary	56.00'	120.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.73 cfs @ 12.22 hrs HW=56.06' TW=0.00' (Dynamic Tailwater)

↑1=Broad-Crested Rectangular Weir (Weir Controls 4.73 cfs @ 0.63 fps)

Pond W1: BVW**Hydrograph**

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1A-S: Sub-1A

Runoff Area=12,960 sf 68.56% Impervious Runoff Depth=4.68"
Tc=6.0 min CN=79 Runoff=1.58 cfs 0.116 af

Subcatchment1B-S: Sub-1B

Runoff Area=31,377 sf 0.00% Impervious Runoff Depth=0.52"
Flow Length=212' Tc=9.6 min CN=35 Runoff=0.14 cfs 0.031 af

Subcatchment1C-S: Sub-1C

Runoff Area=19,404 sf 0.00% Impervious Runoff Depth=0.66"
Flow Length=269' Tc=16.6 min CN=37 Runoff=0.12 cfs 0.024 af

Subcatchment1D-S: Sub-1D

Runoff Area=19,501 sf 3.95% Impervious Runoff Depth=0.88"
Flow Length=185' Tc=11.0 min CN=40 Runoff=0.22 cfs 0.033 af

Subcatchment2S: Sub-2

Runoff Area=16,140 sf 0.00% Impervious Runoff Depth=0.23"
Flow Length=164' Tc=8.6 min CN=30 Runoff=0.01 cfs 0.007 af

Subcatchment3A-S: Sub-3A

Runoff Area=72,040 sf 40.04% Impervious Runoff Depth=2.87"
Flow Length=534' Tc=9.4 min CN=62 Runoff=4.79 cfs 0.396 af

Subcatchment3B-S: Sub-3B

Runoff Area=78,565 sf 21.55% Impervious Runoff Depth=2.58"
Flow Length=552' Tc=12.4 min CN=59 Runoff=4.20 cfs 0.387 af

Subcatchment4S: Sub-4

Runoff Area=15,787 sf 0.00% Impervious Runoff Depth=0.59"
Tc=6.0 min CN=36 Runoff=0.09 cfs 0.018 af

Subcatchment5S: Sub-5

Runoff Area=57,338 sf 14.73% Impervious Runoff Depth=1.37"
Flow Length=438' Tc=14.0 min CN=46 Runoff=1.27 cfs 0.150 af

Reach DP-1: DP-1

Inflow=1.69 cfs 0.173 af
Outflow=1.69 cfs 0.173 af

Reach DP-2: DP-2

Inflow=0.01 cfs 0.007 af
Outflow=0.01 cfs 0.007 af

Reach DP-3: DP-3

Inflow=7.15 cfs 0.771 af
Outflow=7.15 cfs 0.771 af

Reach DP-4: PL

Inflow=0.09 cfs 0.018 af
Outflow=0.09 cfs 0.018 af

Reach DP-5: PL

Inflow=1.27 cfs 0.150 af
Outflow=1.27 cfs 0.150 af

Pond D-1: Exist Detention Basin

Peak Elev=62.00' Storage=7 cf Inflow=0.14 cfs 0.031 af
Discarded=0.14 cfs 0.031 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.031 af

Pond E-DB: Exist Detention Basin

Peak Elev=59.62' Storage=2,259 cf Inflow=4.79 cfs 0.396 af
Outflow=3.15 cfs 0.384 af

27-135 Pre-Development Final (R1-1)*Type III 24-hr 100-Year Rainfall=7.10"*

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 83**Pond W1: BVW**Peak Elev=56.08' Storage=366 cf Inflow=7.15 cfs 0.771 af
Outflow=7.15 cfs 0.771 af**Total Runoff Area = 7.418 ac Runoff Volume = 1.163 af Average Runoff Depth = 1.88"**
80.23% Pervious = 5.951 ac 19.77% Impervious = 1.466 ac

Summary for Subcatchment 1A-S: Sub-1A

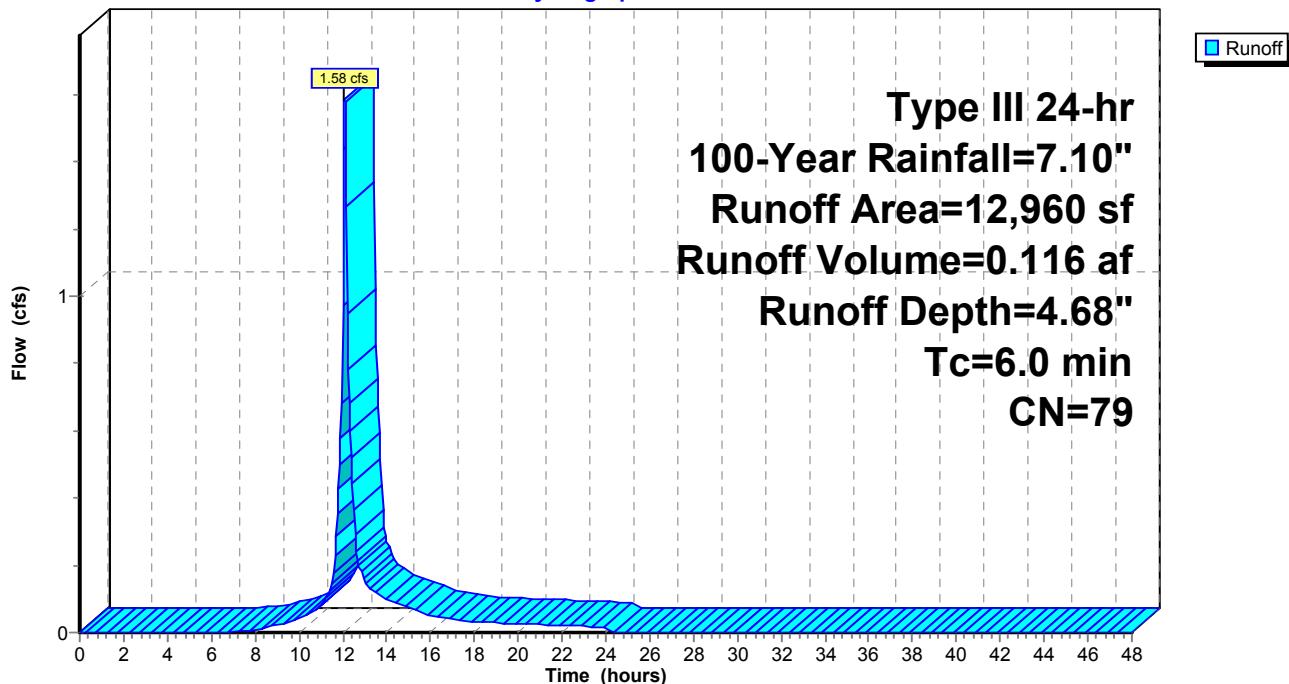
Runoff = 1.58 cfs @ 12.09 hrs, Volume= 0.116 af, Depth= 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description			
4,075	39	>75% Grass cover, Good, HSG A			
8,885	98	Paved roads w/curbs & sewers, HSG A			
12,960	79	Weighted Average			
4,075		31.44% Pervious Area			
8,885		68.56% Impervious Area			
Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1A-S: Sub-1A

Hydrograph



Summary for Subcatchment 1B-S: Sub-1B

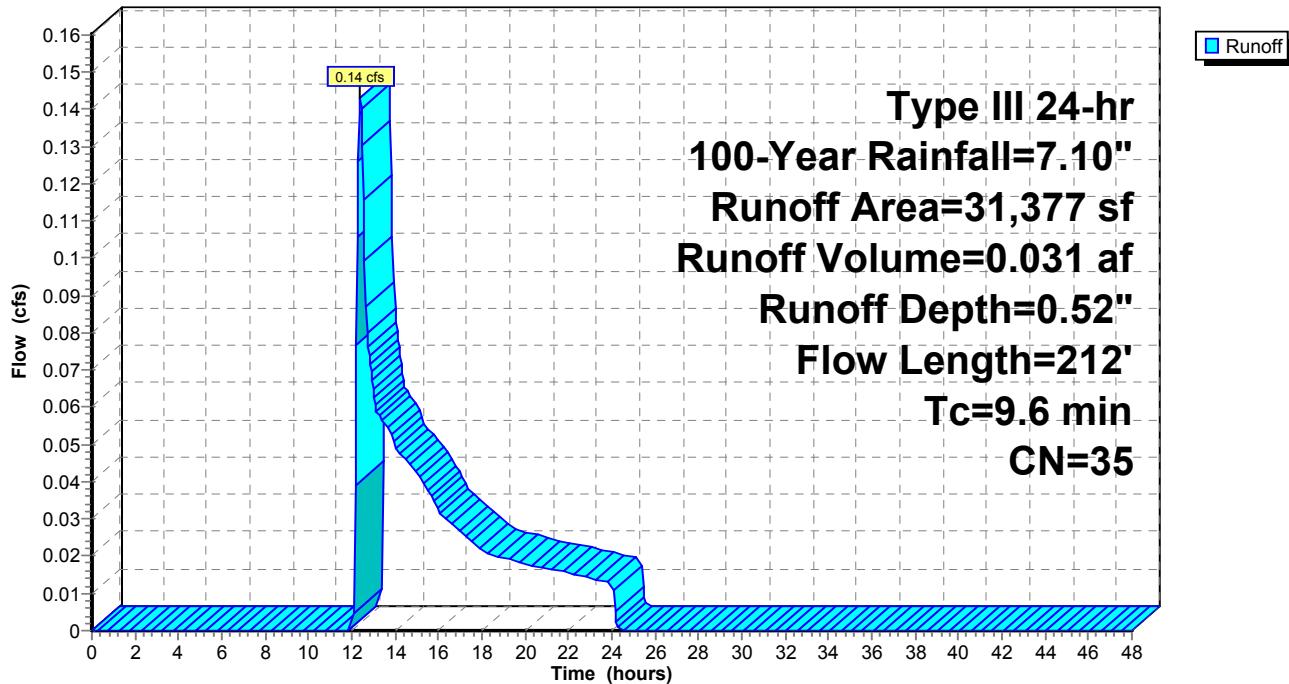
Runoff = 0.14 cfs @ 12.40 hrs, Volume= 0.031 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description			
22,072	30	Woods, Good, HSG A			
1,755	39	>75% Grass cover, Good, HSG A			
7,550	49	50-75% Grass cover, Fair, HSG A			
31,377	35	Weighted Average			
31,377		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0500	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.60"
1.5	162	0.0120	1.76		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.6	212				Total

Subcatchment 1B-S: Sub-1B

Hydrograph



Summary for Subcatchment 1C-S: Sub-1C

Runoff = 0.12 cfs @ 12.46 hrs, Volume= 0.024 af, Depth= 0.66"

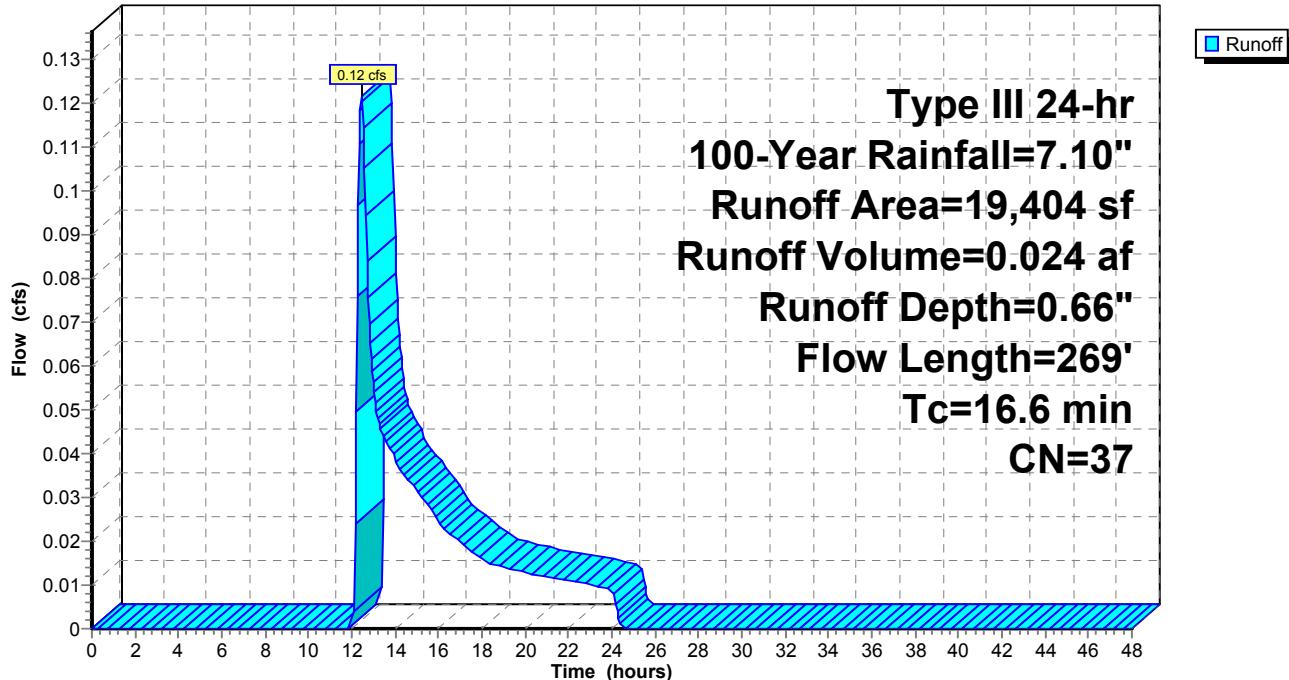
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
12,129	30	Woods, Good, HSG A
1,513	39	>75% Grass cover, Good, HSG A
3,840	55	Woods, Good, HSG B
*		
899	30	Woods, Good, HSG A - offsite
1,023	49	50-75% Grass cover, Fair, HSG A
19,404	37	Weighted Average
19,404		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	50	0.0120	0.06		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
2.3	219	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
16.6	269	Total			

Subcatchment 1C-S: Sub-1C

Hydrograph



Summary for Subcatchment 1D-S: Sub-1D

Runoff = 0.22 cfs @ 12.25 hrs, Volume= 0.033 af, Depth= 0.88"

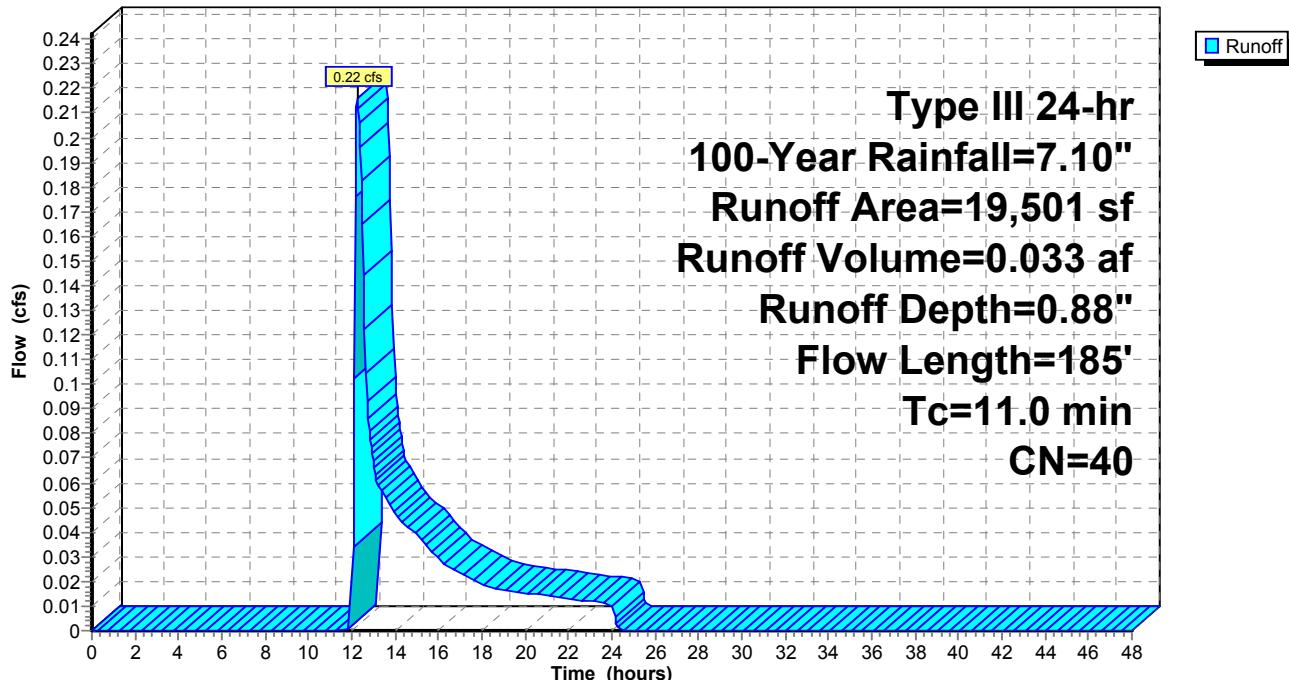
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
10,890	39	>75% Grass cover, Good, HSG A
2,684	49	50-75% Grass cover, Fair, HSG A
*	98	Rubble Pile, HSG A
	30	Woods, Good, HSG A
	40	Weighted Average
		96.05% Pervious Area
5,157		3.95% Impervious Area
19,501		
18,731		
770		

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0300	0.08		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
1.1	135	0.0160	2.04		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
11.0	185	Total			

Subcatchment 1D-S: Sub-1D

Hydrograph



Summary for Subcatchment 2S: Sub-2

Runoff = 0.01 cfs @ 13.75 hrs, Volume= 0.007 af, Depth= 0.23"

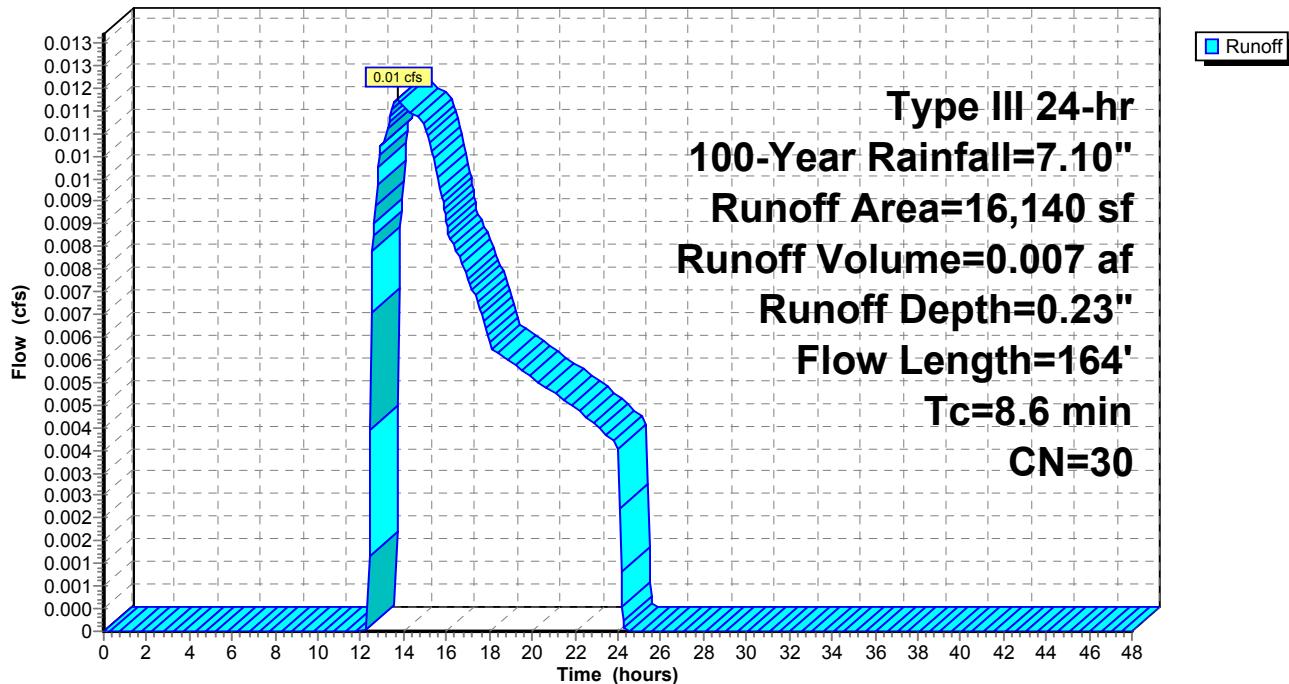
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
16,140	30	Woods, Good, HSG A
16,140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	50	0.0800	0.12		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
1.9	114	0.0383	0.98		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
8.6	164				Total

Subcatchment 2S: Sub-2

Hydrograph



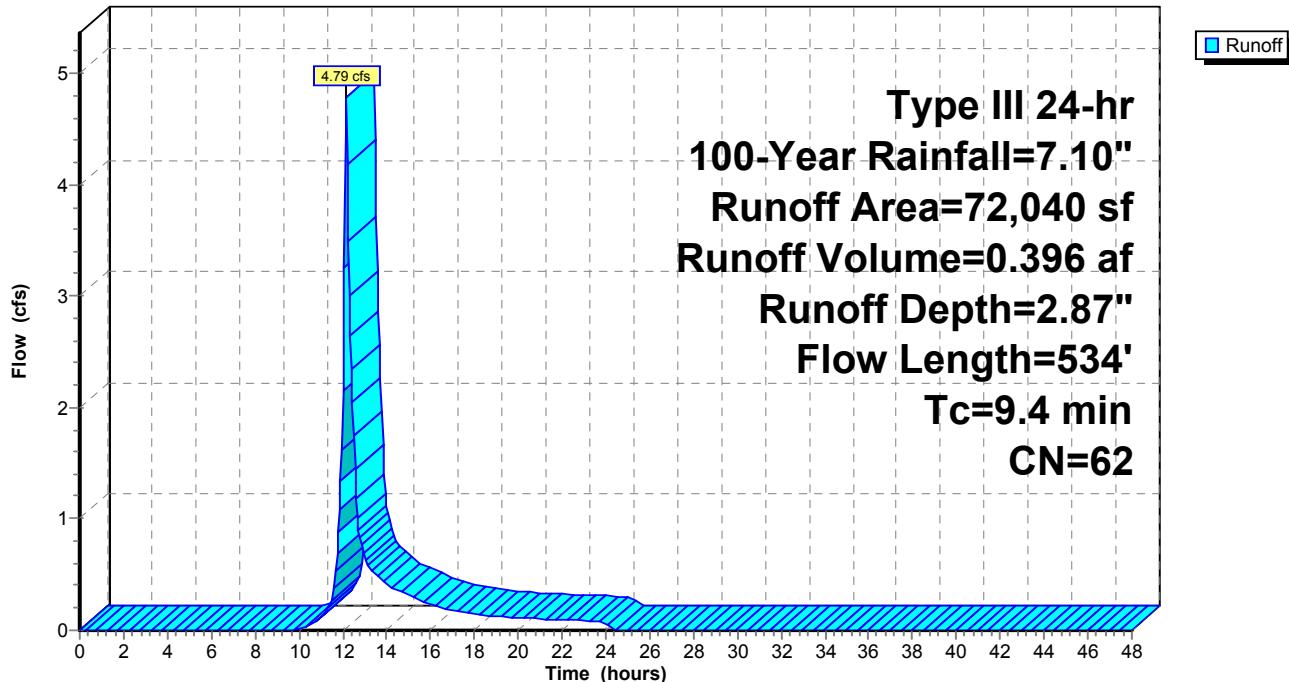
Summary for Subcatchment 3A-S: Sub-3A

Runoff = 4.79 cfs @ 12.14 hrs, Volume= 0.396 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
*	1,384	98 Roofs, HSG A - offsite
*	16,069	98 Paved parking, HSG A - offsite
*	1,682	30 Woods, Good, HSG A - offsite
*	914	>75% Grass cover, Good, HSG A - offsite
24,471	30	Woods, Good, HSG A
6,905	39	>75% Grass cover, Good, HSG A
2,407	98	Paved roads w/curbs & sewers, HSG A
*	2,712	98 Existing Detention Basin, HSG A
*	810	Riprap, HSG A
3,247	98	Paved roads w/curbs & sewers, HSG B
2,784	55	Woods, Good, HSG B
*	938	Riprap, HSG B
6,442	61	>75% Grass cover, Good, HSG B
*	1,275	98 Existing Detention Basin, HSG B
72,040	62	Weighted Average
43,198		59.96% Pervious Area
28,842		40.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.0160	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
1.8	225	0.0160	2.04		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.9	102	0.0090	1.93		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.9	157	0.0030	2.88	3.54	Pipe Channel, RCP_Round 15" 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
9.4	534	Total			

Subcatchment 3A-S: Sub-3A**Hydrograph**

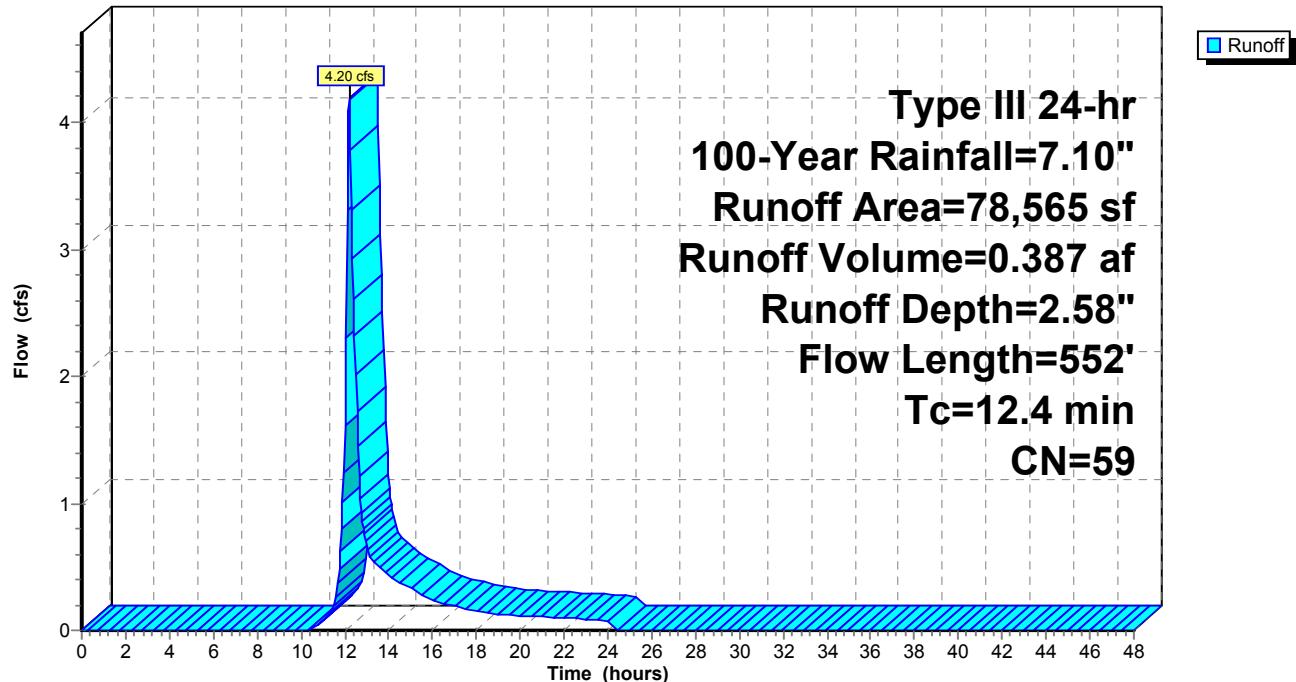
Summary for Subcatchment 3B-S: Sub-3B

Runoff = 4.20 cfs @ 12.18 hrs, Volume= 0.387 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	285	98	Riprap, HSG A
*	121	98	Riprap, HSG B
	9,681	30	Woods, Good, HSG A
	30,788	55	Woods, Good, HSG B
	1,762	39	>75% Grass cover, Good, HSG A
	8,282	61	>75% Grass cover, Good, HSG B
*	15,816	98	Wetlands, HSG B
*	4,310	30	Woods, Good, HSG A - offsite
*	418	98	Wetlands, HSG B - offsite
*	4,121	39	>75% Grass cover, Good, HSG A - offsite
*	290	98	Paved drive, HSG A - offsite
*	957	61	>75% Grass cover, Good, HSG B - offsite
*	1,734	55	Woods, Good, HSG B - offsite
	78,565	59	Weighted Average
	61,635		78.45% Pervious Area
	16,930		21.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	50	0.0700	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.60"
1.5	294	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.9	208	0.0030	0.88		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
12.4	552	Total			

Subcatchment 3B-S: Sub-3B**Hydrograph**

Summary for Subcatchment 4S: Sub-4

Runoff = 0.09 cfs @ 12.32 hrs, Volume= 0.018 af, Depth= 0.59"

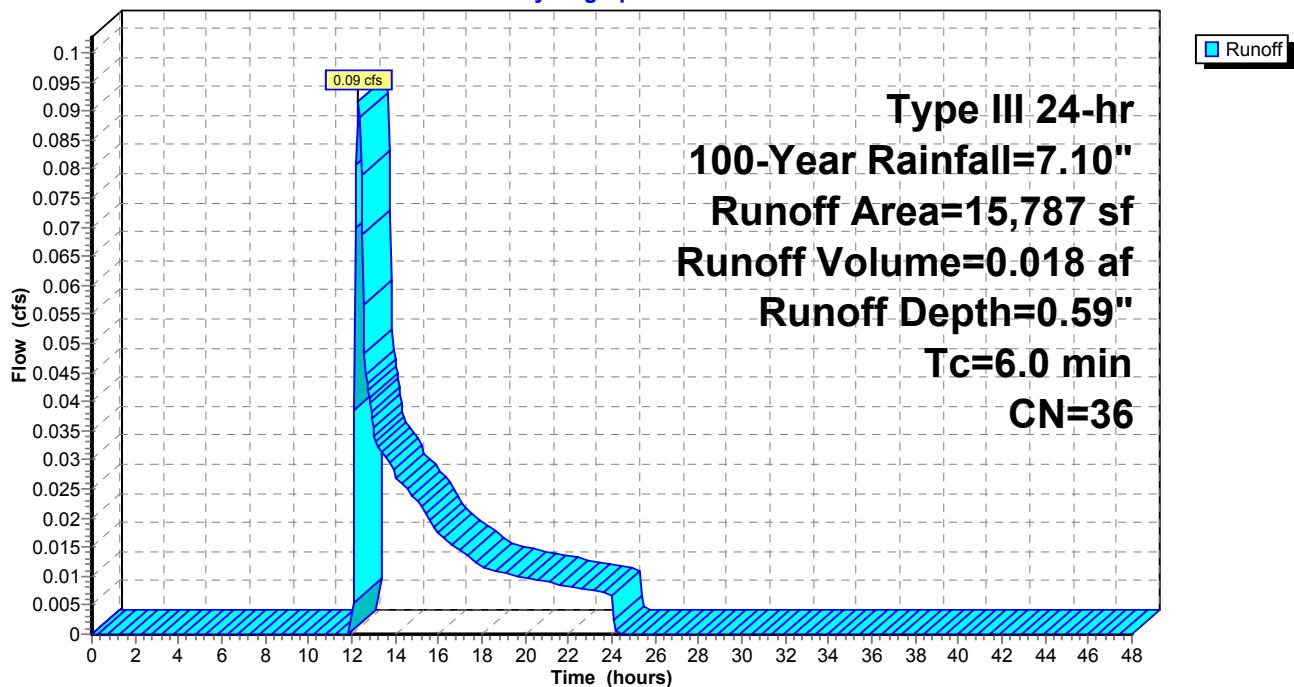
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
15,787	36	Woods, Fair, HSG A
15,787		100.00% Pervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 4S: Sub-4

Hydrograph



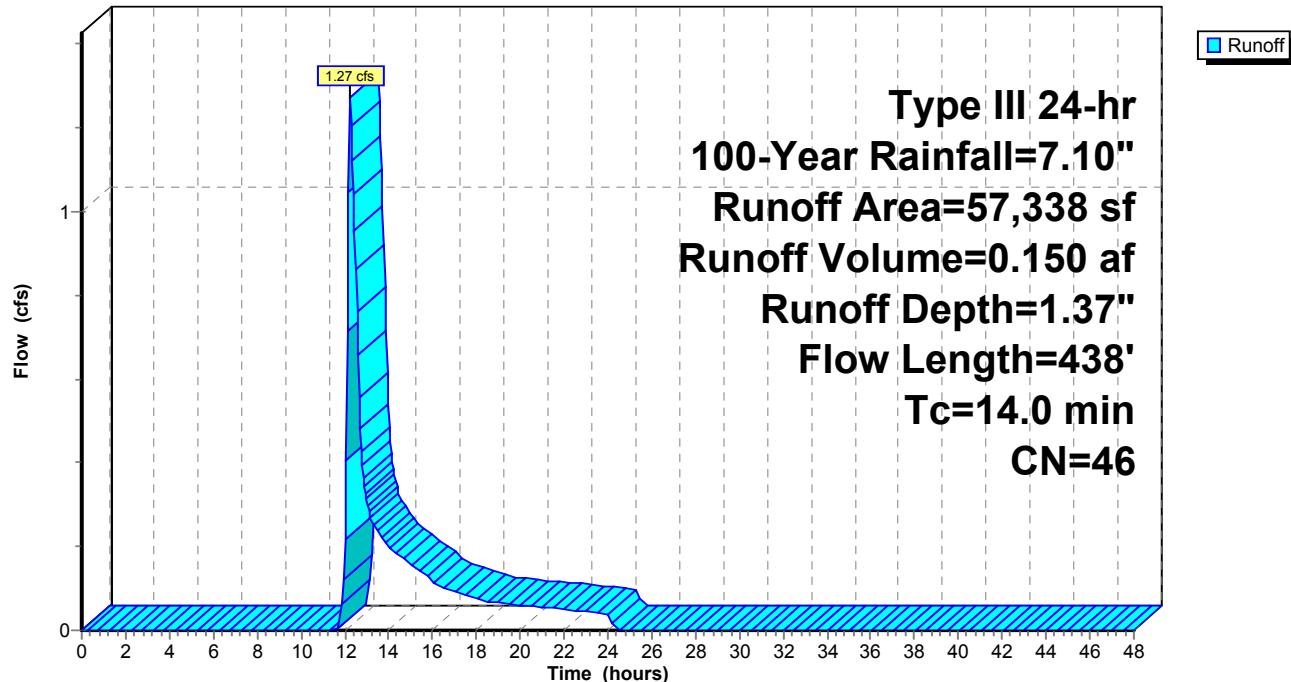
Summary for Subcatchment 5S: Sub-5

Runoff = 1.27 cfs @ 12.24 hrs, Volume= 0.150 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
32,867	36	Woods, Fair, HSG A
15,631	39	>75% Grass cover, Good, HSG A
395	80	>75% Grass cover, Good, HSG D
*	293	Paved drive, HSG D
2,148	98	Roofs, HSG A
*	5,236	Paved drive, HSG A
*	533	Patio, HSG A
*	235	Misc, HSG A
57,338	46	Weighted Average
48,893		85.27% Pervious Area
8,445		14.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	39	0.1538	0.15		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
1.8	11	0.1100	0.10		Sheet Flow, B-C Woods: Light underbrush n= 0.400 P2= 3.60"
0.2	22	0.1166	1.71		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
0.9	54	0.0370	0.96		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
0.6	52	0.0770	1.39		Shallow Concentrated Flow, E-F Woodland Kv= 5.0 fps
5.5	175	0.0114	0.53		Shallow Concentrated Flow, F-G Woodland Kv= 5.0 fps
0.8	85	0.1176	1.71		Shallow Concentrated Flow, G-H Woodland Kv= 5.0 fps
14.0	438	Total			

Subcatchment 5S: Sub-5**Hydrograph**

Summary for Reach DP-1: DP-1

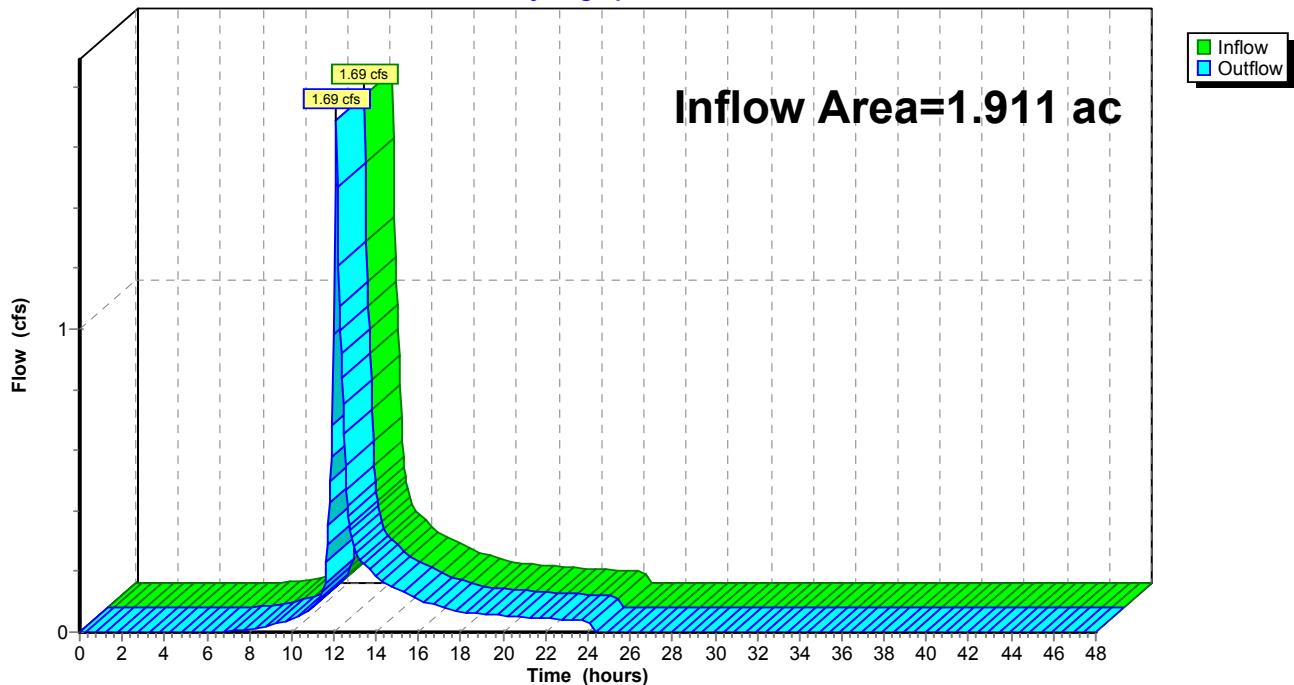
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.911 ac, 11.60% Impervious, Inflow Depth = 1.09" for 100-Year event
 Inflow = 1.69 cfs @ 12.10 hrs, Volume= 0.173 af
 Outflow = 1.69 cfs @ 12.10 hrs, Volume= 0.173 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-1: DP-1

Hydrograph



Summary for Reach DP-2: DP-2

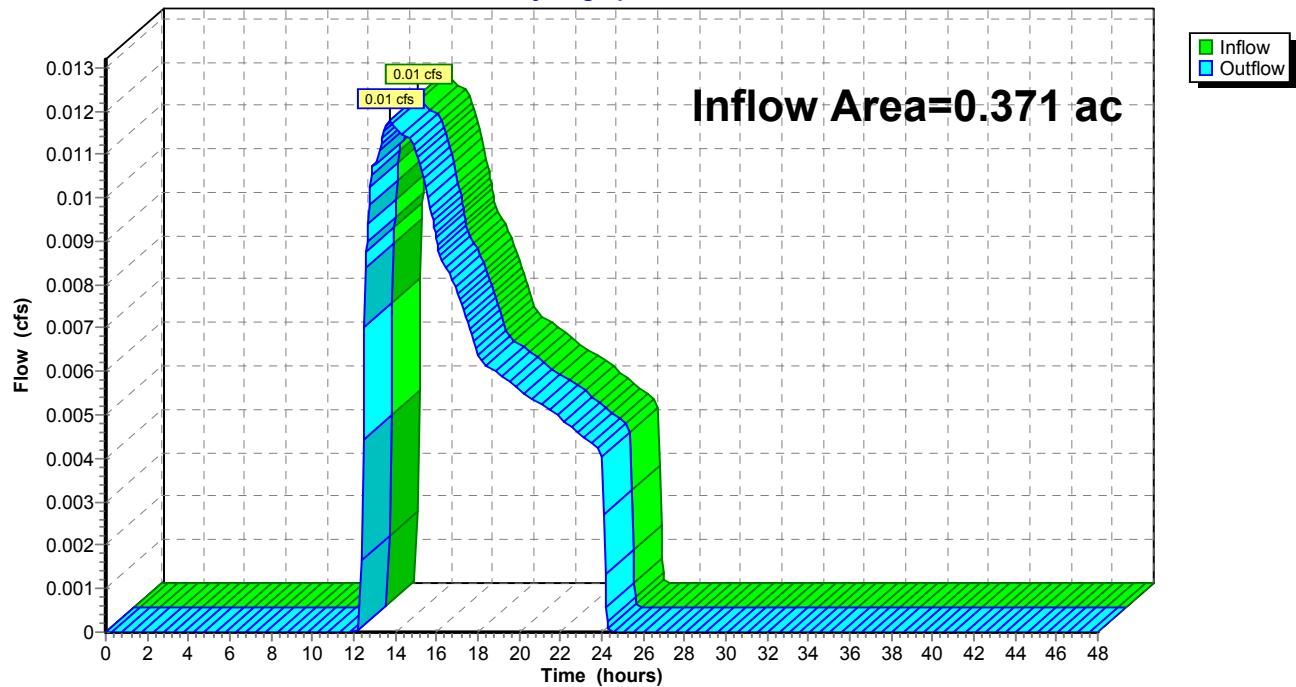
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.371 ac, 0.00% Impervious, Inflow Depth = 0.23" for 100-Year event
 Inflow = 0.01 cfs @ 13.75 hrs, Volume= 0.007 af
 Outflow = 0.01 cfs @ 13.75 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-2: DP-2

Hydrograph



Summary for Reach DP-3: DP-3

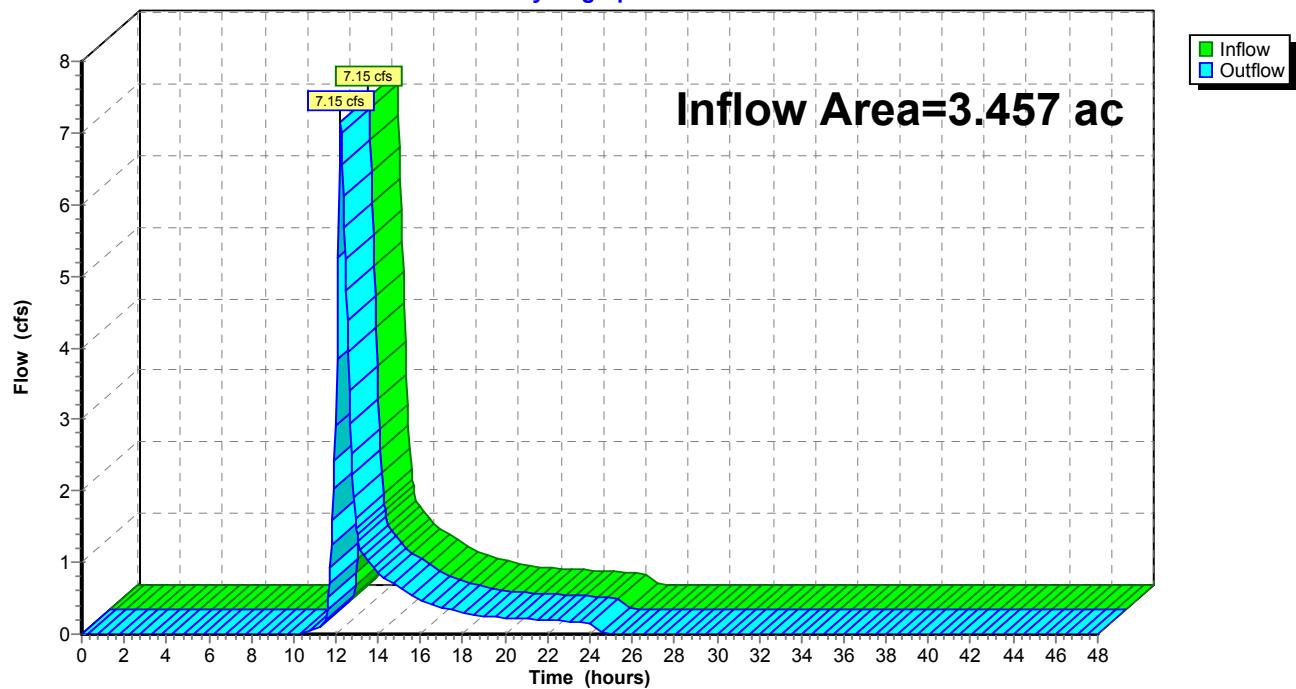
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.457 ac, 30.39% Impervious, Inflow Depth = 2.67" for 100-Year event
 Inflow = 7.15 cfs @ 12.22 hrs, Volume= 0.771 af
 Outflow = 7.15 cfs @ 12.22 hrs, Volume= 0.771 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-3: DP-3

Hydrograph



Summary for Reach DP-4: PL

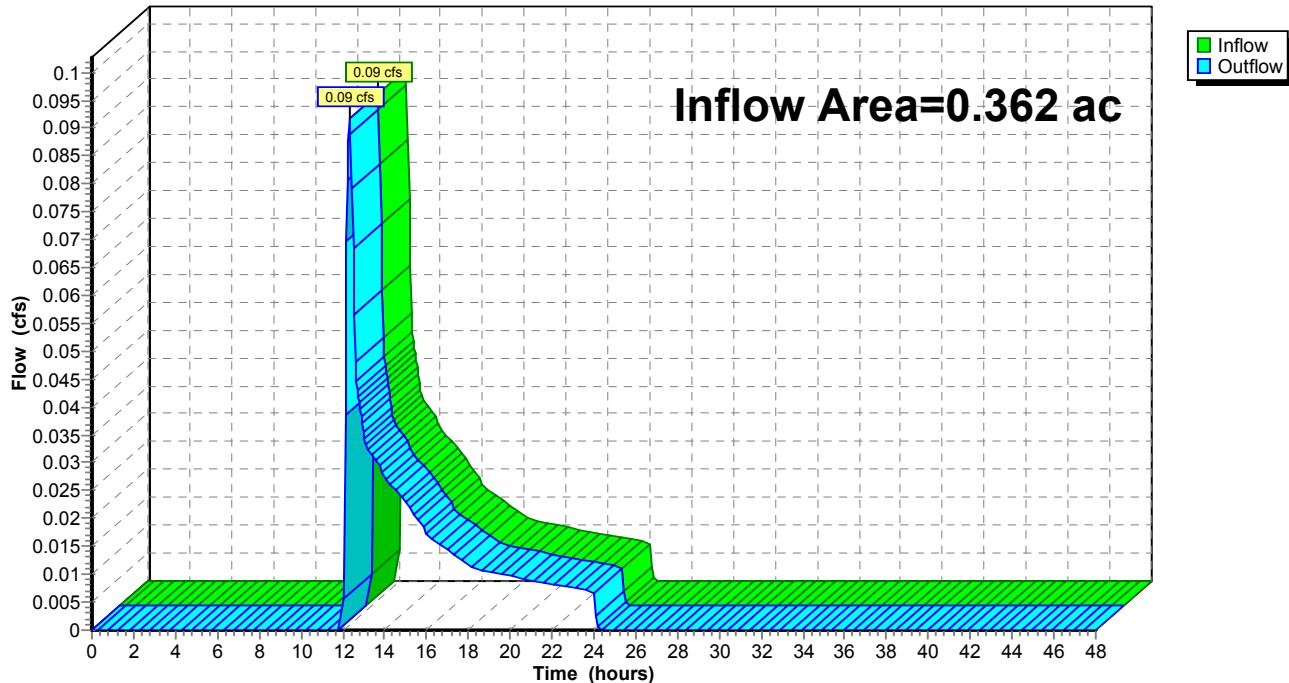
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.362 ac, 0.00% Impervious, Inflow Depth = 0.59" for 100-Year event
 Inflow = 0.09 cfs @ 12.32 hrs, Volume= 0.018 af
 Outflow = 0.09 cfs @ 12.32 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-4: PL

Hydrograph



Summary for Reach DP-5: PL

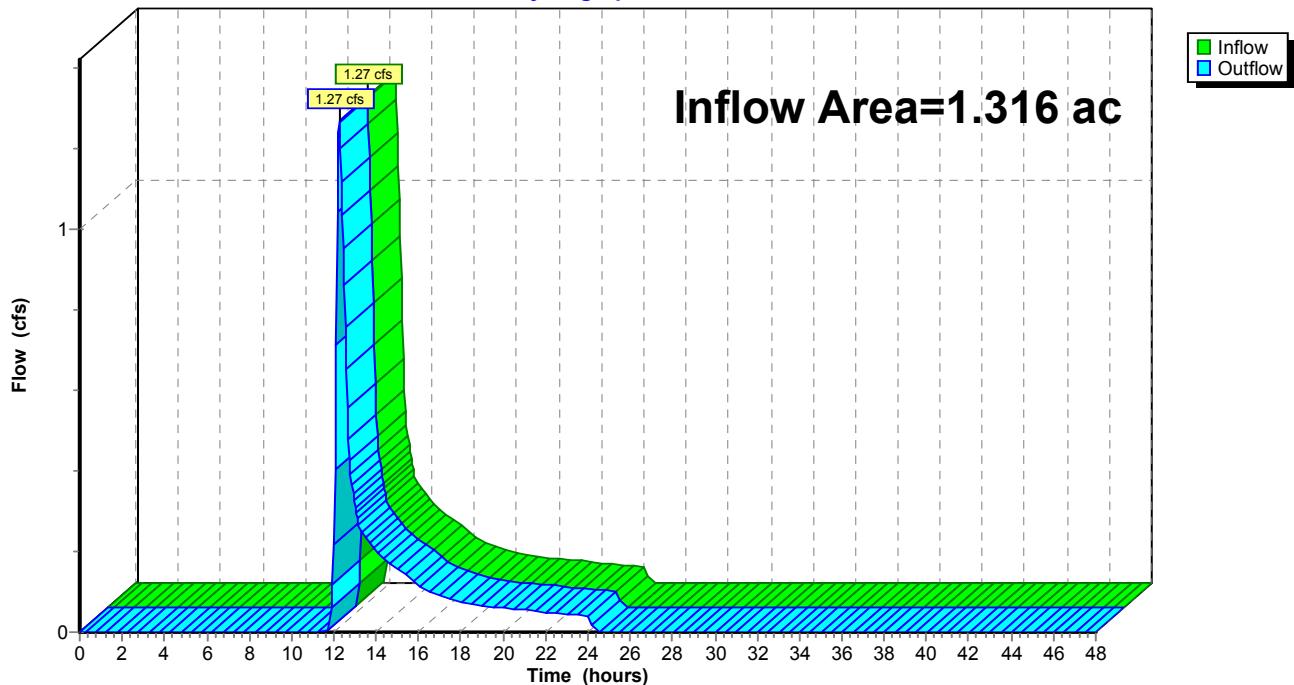
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.316 ac, 14.73% Impervious, Inflow Depth = 1.37" for 100-Year event
 Inflow = 1.27 cfs @ 12.24 hrs, Volume= 0.150 af
 Outflow = 1.27 cfs @ 12.24 hrs, Volume= 0.150 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-5: PL

Hydrograph



Summary for Pond D-1: Exist Detention Basin

Inflow Area = 0.720 ac, 0.00% Impervious, Inflow Depth = 0.52" for 100-Year event
 Inflow = 0.14 cfs @ 12.40 hrs, Volume= 0.031 af
 Outflow = 0.14 cfs @ 12.42 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.9 min
 Discarded = 0.14 cfs @ 12.42 hrs, Volume= 0.031 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 62.00' @ 12.42 hrs Surf.Area= 4,340 sf Storage= 7 cf

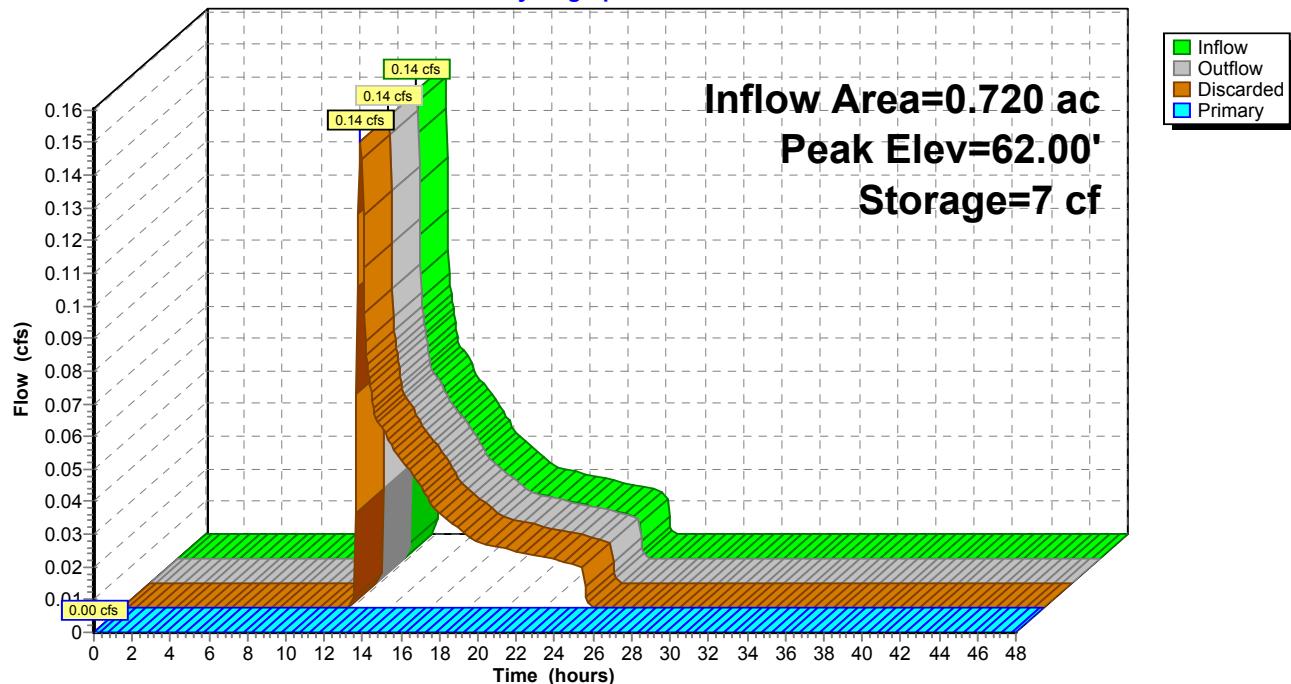
Plug-Flow detention time= 0.9 min calculated for 0.031 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (964.5 - 963.6)

Volume	Invert	Avail.Storage	Storage Description	
#1	62.00'	5,584 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
62.00	4,336	0	0	
63.00	6,832	5,584	5,584	

Device	Routing	Invert	Outlet Devices	
#1	Primary	63.00'	10.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32	
#2	Discarded	62.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.01'	

Discarded OutFlow Max=0.14 cfs @ 12.42 hrs HW=62.00' (Free Discharge)
 ↑ 2=Exfiltration (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.00' TW=0.00' (Dynamic Tailwater)
 ↑ 1=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond D-1: Exist Detention Basin**Hydrograph**

Summary for Pond E-DB: Exist Detention Basin

Inflow Area = 1.654 ac, 40.04% Impervious, Inflow Depth = 2.87" for 100-Year event
 Inflow = 4.79 cfs @ 12.14 hrs, Volume= 0.396 af
 Outflow = 3.15 cfs @ 12.29 hrs, Volume= 0.384 af, Atten= 34%, Lag= 8.8 min
 Primary = 3.15 cfs @ 12.29 hrs, Volume= 0.384 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 59.62' @ 12.29 hrs Surf.Area= 2,613 sf Storage= 2,259 cf

Plug-Flow detention time= 29.7 min calculated for 0.383 af (97% of inflow)
 Center-of-Mass det. time= 12.1 min (863.3 - 851.2)

Volume	Invert	Avail.Storage	Storage Description	
#1	58.00'	7,013 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)

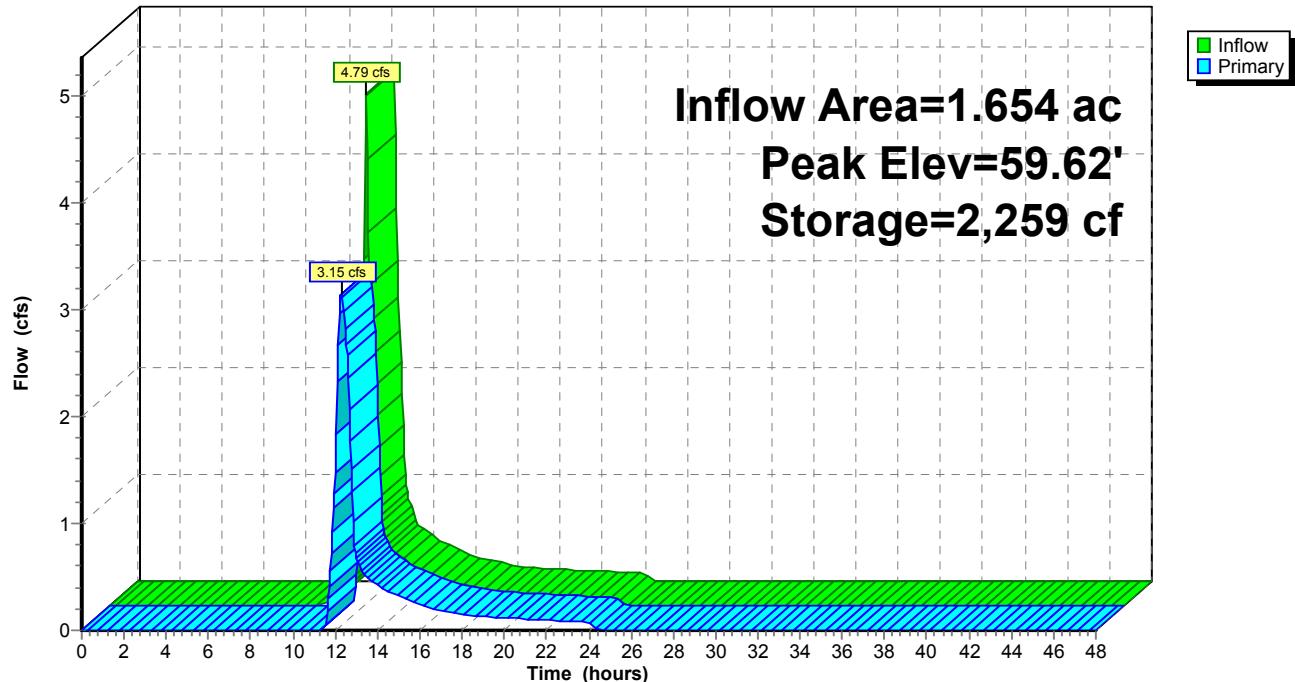
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	445	0	0
59.00	1,511	978	978
60.00	3,286	2,399	3,377
61.00	3,987	3,637	7,013

Device	Routing	Invert	Outlet Devices
#1	Primary	58.12'	12.0" Round RCP_Round 12" L= 25.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 58.12' / 58.05' S= 0.0028 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	58.68'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=3.14 cfs @ 12.29 hrs HW=59.62' TW=56.08' (Dynamic Tailwater)

↑ 1=RCP_Round 12" (Barrel Controls 3.14 cfs @ 4.00 fps)

↑ 2=Sharp-Crested Rectangular Weir (Passes 3.14 cfs of 15.95 cfs potential flow)

Pond E-DB: Exist Detention Basin**Hydrograph**

Summary for Pond W1: BVW

Inflow Area = 3.457 ac, 30.39% Impervious, Inflow Depth = 2.67" for 100-Year event
 Inflow = 7.15 cfs @ 12.21 hrs, Volume= 0.771 af
 Outflow = 7.15 cfs @ 12.22 hrs, Volume= 0.771 af, Atten= 0%, Lag= 0.6 min
 Primary = 7.15 cfs @ 12.22 hrs, Volume= 0.771 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 56.08' @ 12.22 hrs Surf.Area= 4,860 sf Storage= 366 cf

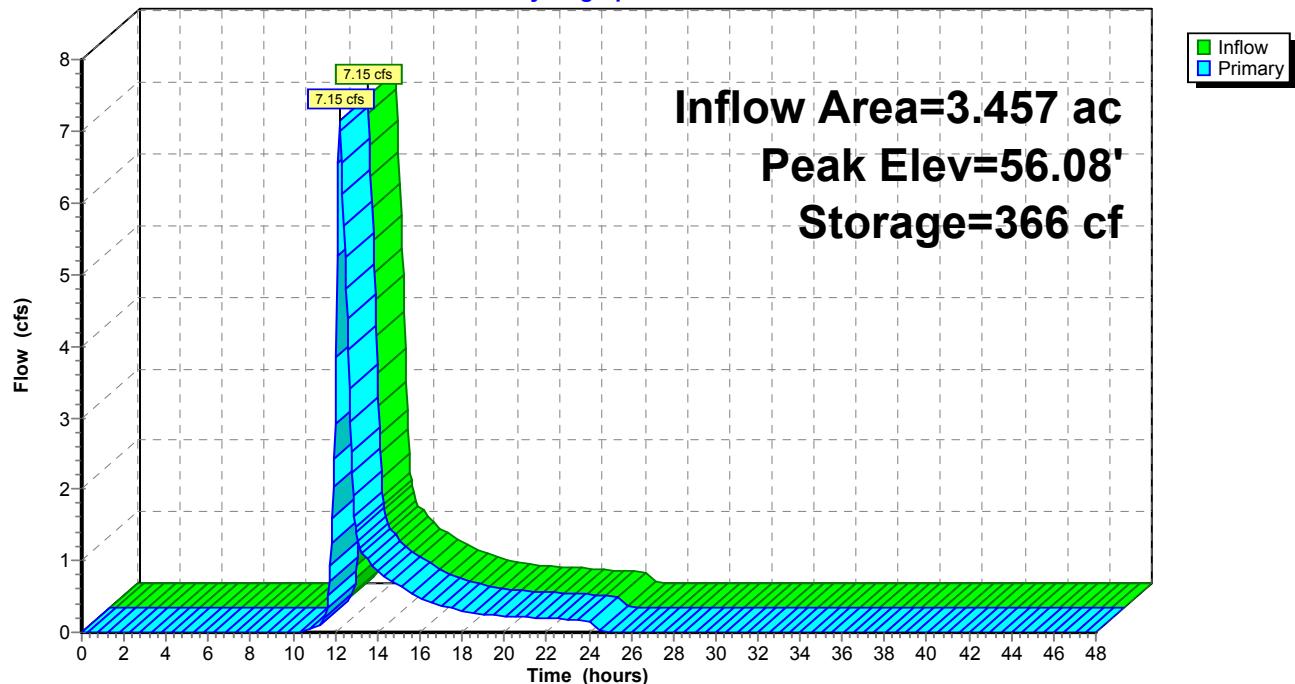
Plug-Flow detention time= 1.7 min calculated for 0.771 af (100% of inflow)
 Center-of-Mass det. time= 1.5 min (863.6 - 862.2)

Volume	Invert	Avail.Storage	Storage Description	
#1	56.00'	11,314 cf	Custom Stage Data (Irregular)	Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	3,962	413.1	0	0	3,962
57.00	20,884	797.8	11,314	11,314	41,037

Device	Routing	Invert	Outlet Devices	
#1	Primary	56.00'	120.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64	

Primary OutFlow Max=7.07 cfs @ 12.22 hrs HW=56.08' TW=0.00' (Dynamic Tailwater)
 ↑ 1=Broad-Crested Rectangular Weir (Weir Controls 7.07 cfs @ 0.71 fps)

Pond W1: BVW**Hydrograph**

A P P E N D I X B

Post-Development Condition

COMPREHENSIVE PERMIT PLAN

KNOWN AS
RIVER STONE
(ASSESSOR'S MAP 124, LOTS 70-75 & LOTS 26)
HINGHAM, MASSACHUSETTS

REV	DATE	DESCRIPTION	BY APP
-----	------	-------------	--------

MCKENZIE ENGINEERING GROUP

Assinippi Office Park

150 Longwater Drive, Suite 101

Norwell, MA 02061

Ph: 781-792-3900

www.mckeng.com

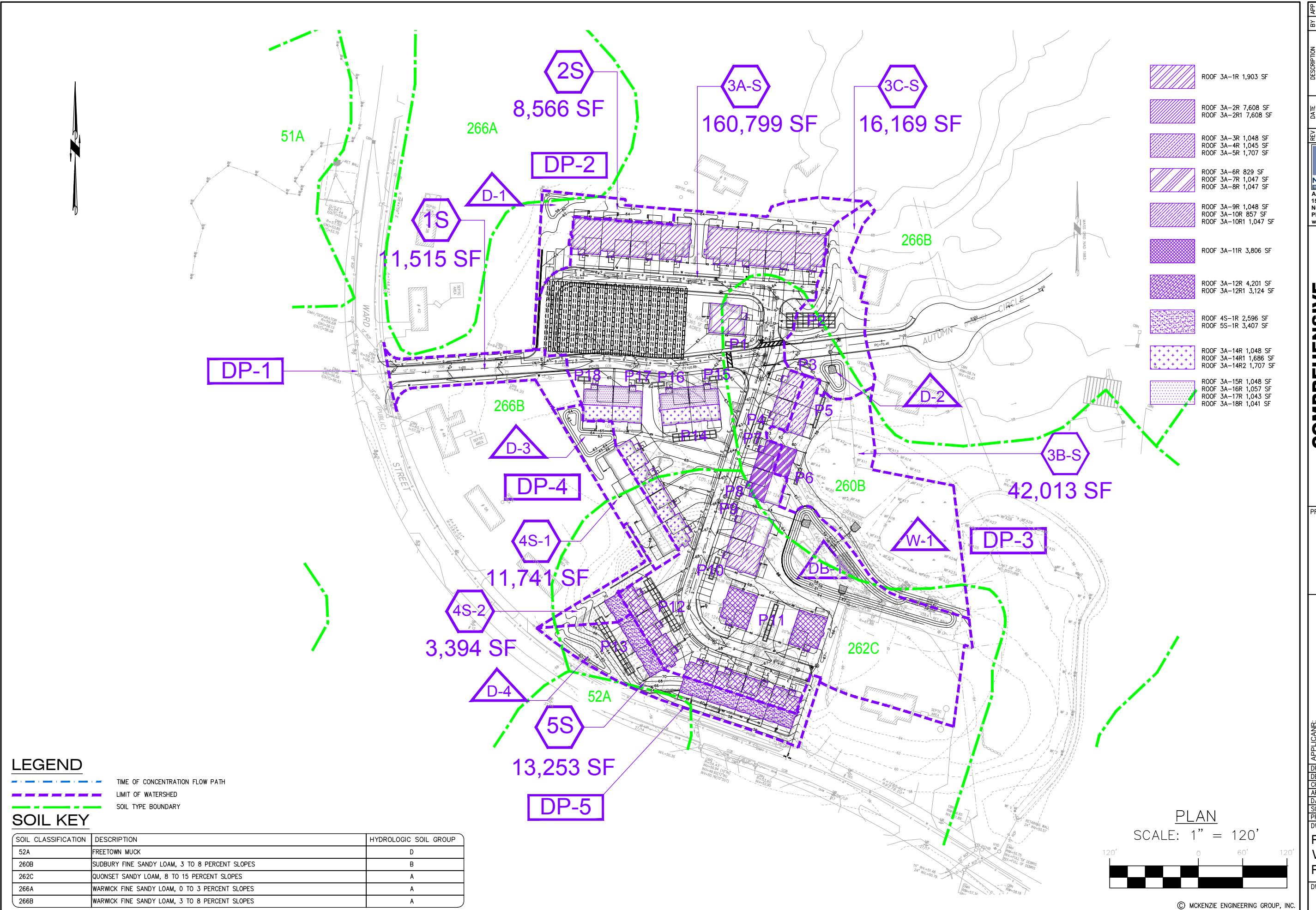
PROFESSIONAL ENGINEER:	
------------------------	--

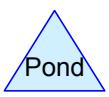
APPLICANT:
RIVER STONE, LLC
299R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

DRAWN BY: SBS
DESIGNED BY: SBS
CHECKED BY: BCM
APPROVED BY: BCM
DATE: JANUARY 8, 2018
SCALE: 1" = 120'
PROJECT NO.: 27-135
DWG. TITLE: Post-Dev. Watershed Plan

DWG. No: WS-2
© MCKENZIE ENGINEERING GROUP, INC.

M:\MEG\2007 PROJECTS\27-135\DWGS\LOT SHEETS\SUBMISSION R1\27-135 WS-2 (R1).DWG





Routing Diagram for 27-135 Post-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

27-135 Post-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.284	39	>75% Grass cover, Good, HSG A (1S, 2S, 3A-S, 3B-S, 3C-S, 4S-1, 4S-2, 5S)
0.099	39	>75% Grass cover, Good, HSG A - offsite (3A-S, 3B-S, 3C-S)
0.442	61	>75% Grass cover, Good, HSG B (3A-S, 3B-S, 3C-S)
0.022	61	>75% Grass cover, Good, HSG B - offsite (3B-S)
0.015	61	>75% Grass cover, Good, HSG D (5S)
0.118	98	Decks, HSG A (2S, 3A-S, 4S-1, 4S-2, 5S)
0.019	98	Decks, HSG B (3A-S, 3B-S, 3C-S)
0.000	98	Decks, HSG D (5S)
0.175	98	Detention Basin, HSG A (3A-S)
0.095	98	Detention Basin, HSG B (3A-S)
0.342	98	Paved drives, HSG A (3A-S)
0.007	98	Paved drives, HSG A - offsite (3C-S)
0.047	98	Paved drives, HSG B (3A-S)
0.369	98	Paved parking, HSG A - offsite (3A-S)
0.693	98	Paved roads w/curbs & sewers, HSG A (1S, 3A-S, 3C-S)
0.016	98	Paved roads w/curbs & sewers, HSG A - offsite (3C-S)
0.240	98	Paved roads w/curbs & sewers, HSG B (3A-S, 3C-S)
0.082	98	Paved sidewalk, HSG A (3A-S, 3C-S)
0.005	98	Paved sidewalk, HSG B (3C-S)
0.023	98	Paved sidewalk, HSG B (3A-S)
1.198	98	Roofs, HSG A (3A-10R, 3A-10R1, 3A-11R, 3A-12R, 3A-12R1, 3A-14R, 3A-14R1, 3A-14R2, 3A-15R, 3A-16R, 3A-17R, 3A-18R, 3A-1R, 3A-2R, 3A-2R1, 3A-8R, 3A-9R, 3A-S, 4S-1, 4S-1R, 5S-1R)
0.032	98	Roofs, HSG A - offsite (3A-S)
0.200	98	Roofs, HSG B (3A-1R, 3A-3R, 3A-4R, 3A-5R, 3A-6R, 3A-7R, 3A-8R, 3A-S)
0.027	98	Walks, HSG A (3A-S)
0.004	98	Walks, HSG B (3A-S)
0.009	98	Walls, HSG A (2S, 3A-S, 4S-2, 5S)
0.001	98	Walls, HSG D (5S)
0.363	98	Wetlands, HSG B (3B-S)
0.010	98	Wetlands, HSG B - offsite (3B-S)
0.033	30	Woods, Good, HSG A (3B-S)
0.158	30	Woods, Good, HSG A - offsite (3A-S, 3B-S, 3C-S)
0.249	55	Woods, Good, HSG B (3B-S)
0.040	55	Woods, Good, HSG B - offsite (3B-S)
7.418	73	TOTAL AREA

27-135 Post-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.642	HSG A	1S, 2S, 3A-10R, 3A-10R1, 3A-11R, 3A-12R, 3A-12R1, 3A-14R, 3A-14R1, 3A-14R2, 3A-15R, 3A-16R, 3A-17R, 3A-18R, 3A-1R, 3A-2R, 3A-2R1, 3A-8R, 3A-9R, 3A-S, 3B-S, 3C-S, 4S-1, 4S-1R, 4S-2, 5S, 5S-1R
1.759	HSG B	3A-1R, 3A-3R, 3A-4R, 3A-5R, 3A-6R, 3A-7R, 3A-8R, 3A-S, 3B-S, 3C-S
0.000	HSG C	
0.016	HSG D	5S
0.000	Other	
7.418		TOTAL AREA

27-135 Post-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 4

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
2.383	0.464	0.000	0.015	0.000	2.862	>75% Grass cover, Good	1S, 2S, 3A-S, 3B-S, 3C-S, 4S-1, 4S-2, 5S
0.118	0.019	0.000	0.000	0.000	0.138	Decks	2S, 3A-S, 3B-S, 3C-S, 4S-1, 4S-2, 5S
0.175	0.095	0.000	0.000	0.000	0.270	Detention Basin	3A-S
0.349	0.047	0.000	0.000	0.000	0.396	Paved drives	3A-S, 3C-S
0.369	0.000	0.000	0.000	0.000	0.369	Paved parking	3A-S
0.709	0.240	0.000	0.000	0.000	0.949	Paved roads w/curbs & sewers	1S, 3A-S, 3C-S

27-135 Post-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 5

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.082	0.005	0.000	0.000	0.000	0.087	Paved sidewalk	3A-S, 3C-S
0.000	0.023	0.000	0.000	0.000	0.023	Paved sidewalk.	3A-S
1.230	0.200	0.000	0.000	0.000	1.430	Roofs	3A-10R, 3A-10R1,
							3A-11R, 3A-12R, 3A-12R1,
							3A-14R, 3A-14R1,
							3A-14R2,
							3A-15R, 3A-16R, 3A-17R, 3A-18R,

27-135 Post-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 6**Ground Covers (all nodes) (continued)**

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.027	0.004	0.000	0.000	0.000	0.031	Walks	3A-S
0.009	0.000	0.000	0.001	0.000	0.010	Walls	2S,
							3A-S, 4S-2, 5S
0.000	0.373	0.000	0.000	0.000	0.373	Wetlands	3B-S
0.191	0.289	0.000	0.000	0.000	0.480	Woods, Good	3A-S, 3B-S, 3C-S
5.642	1.759	0.000	0.016	0.000	7.418	TOTAL AREA	

27-135 Post-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 7

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	DB-1	58.20	58.05	25.0	0.0060	0.013	10.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Sub-1	Runoff Area=11,515 sf 47.75% Impervious Runoff Depth=0.91" Tc=6.0 min CN=67 Runoff=0.25 cfs 0.020 af
Subcatchment2S: Sub-2	Runoff Area=8,566 sf 7.82% Impervious Runoff Depth=0.08" Tc=6.0 min CN=44 Runoff=0.00 cfs 0.001 af
Subcatchment3A-10R: Roofs 15 B	Runoff Area=857 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.07 cfs 0.006 af
Subcatchment3A-10R1: Roofs 15 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af
Subcatchment3A-11R: Roofs 16-17 FB	Runoff Area=3,806 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.30 cfs 0.025 af
Subcatchment3A-12R: Roofs 18-21 F	Runoff Area=4,201 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.33 cfs 0.027 af
Subcatchment3A-12R1: Roofs 22-24 F	Runoff Area=3,124 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.25 cfs 0.020 af
Subcatchment3A-14R: Roofs 25-28 F	Runoff Area=4,152 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.33 cfs 0.027 af
Subcatchment3A-14R1: Roofs 29-30 B	Runoff Area=1,686 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-14R2: Roofs 31-32 B	Runoff Area=1,707 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-15R: Roofs 29-30 F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af
Subcatchment3A-16R: Roofs 29-30 F	Runoff Area=1,057 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af
Subcatchment3A-17R: Roofs 31-32 F	Runoff Area=1,043 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af
Subcatchment3A-18R: Roofs 31-32 F	Runoff Area=1,041 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af
Subcatchment3A-1R: Roof 5	Runoff Area=1,903 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af
Subcatchment3A-2R: Roofs 1-4 FB	Runoff Area=7,608 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.60 cfs 0.049 af

Subcatchment3A-2R1: Roofs 6-9 FB	Runoff Area=7,608 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.60 cfs 0.049 af
Subcatchment3A-3R: Roofs 10-F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af
Subcatchment3A-4R: Roofs 11 F	Runoff Area=1,045 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af
Subcatchment3A-5R: Roofs 10-11 B	Runoff Area=1,707 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-6R: Roofs 12 B	Runoff Area=829 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.07 cfs 0.005 af
Subcatchment3A-7R: Roofs 12 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af
Subcatchment3A-8R: Roofs 13 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af
Subcatchment3A-9R: Roofs 14 F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af
Subcatchment3A-S: Sub-3A	Runoff Area=160,799 sf 55.72% Impervious Runoff Depth=1.25" Tc=6.0 min CN=73 Runoff=5.10 cfs 0.384 af
Subcatchment3B-S: Sub-3B	Runoff Area=42,013 sf 40.23% Impervious Runoff Depth=1.13" Tc=6.0 min CN=71 Runoff=1.18 cfs 0.091 af
Subcatchment3C-S: Sub-3C	Runoff Area=16,169 sf 20.21% Impervious Runoff Depth=0.42" Tc=6.0 min CN=56 Runoff=0.09 cfs 0.013 af
Subcatchment4S-1: Sub-4	Runoff Area=11,741 sf 37.46% Impervious Runoff Depth=0.62" Tc=6.0 min CN=61 Runoff=0.14 cfs 0.014 af
Subcatchment4S-1R: Roofs 22-24 B	Runoff Area=2,596 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.20 cfs 0.017 af
Subcatchment4S-2: Sub-4	Runoff Area=3,394 sf 9.16% Impervious Runoff Depth=0.08" Tc=6.0 min CN=44 Runoff=0.00 cfs 0.001 af
Subcatchment5S: Sub -5	Runoff Area=13,253 sf 9.23% Impervious Runoff Depth=0.10" Tc=6.0 min CN=45 Runoff=0.00 cfs 0.003 af
Subcatchment5S-1R: Roofs 18-21 B	Runoff Area=3,407 sf 100.00% Impervious Runoff Depth=3.37" Tc=6.0 min CN=98 Runoff=0.27 cfs 0.022 af
Reach DP-1: DMH	Inflow=0.25 cfs 0.020 af Outflow=0.25 cfs 0.020 af

Reach DP-2: DP-2	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach DP-3: DP-3	Inflow=1.15 cfs 0.091 af Outflow=1.15 cfs 0.091 af
Reach DP-4: PL	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach DP-5: PL	Inflow=0.00 cfs 0.003 af Outflow=0.00 cfs 0.003 af
Pond D-1: Depression	Peak Elev=59.00' Storage=0 cf Inflow=0.00 cfs 0.001 af Discarded=0.00 cfs 0.001 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af
Pond D-2: Depression	Peak Elev=58.01' Storage=5 cf Inflow=0.09 cfs 0.013 af Discarded=0.09 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.013 af
Pond D-3: Depression	Peak Elev=63.16' Storage=129 cf Inflow=0.14 cfs 0.014 af Discarded=0.03 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.014 af
Pond D-4: Depression	Peak Elev=59.04' Storage=23 cf Inflow=0.00 cfs 0.001 af Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Pond DB-1: Prop Detention Basin	Peak Elev=60.16' Storage=16,714 cf Inflow=5.10 cfs 0.384 af Outflow=0.00 cfs 0.000 af
Pond P1: Infiltration Chambers	Peak Elev=57.11' Storage=102 cf Inflow=0.15 cfs 0.012 af Outflow=0.04 cfs 0.012 af
Pond P10: Infiltration Chambers	Peak Elev=60.51' Storage=101 cf Inflow=0.15 cfs 0.012 af Outflow=0.04 cfs 0.012 af
Pond P11: Infiltration Chambers	Peak Elev=64.18' Storage=236 cf Inflow=0.30 cfs 0.025 af Outflow=0.06 cfs 0.025 af
Pond P12: Infiltration Chambers	Peak Elev=56.83' Storage=297 cf Inflow=0.58 cfs 0.047 af Outflow=0.19 cfs 0.047 af
Pond P13: Infiltration Chambers	Peak Elev=56.67' Storage=185 cf Inflow=0.47 cfs 0.039 af Outflow=0.19 cfs 0.039 af
Pond P14: Infiltration Chambers	Peak Elev=59.62' Storage=464 cf Inflow=0.59 cfs 0.049 af Outflow=0.13 cfs 0.049 af
Pond P15: Infiltration Chambers	Peak Elev=60.51' Storage=55 cf Inflow=0.08 cfs 0.007 af Outflow=0.02 cfs 0.007 af
Pond P16: Infiltration Chambers	Peak Elev=60.52' Storage=56 cf Inflow=0.08 cfs 0.007 af Outflow=0.02 cfs 0.007 af

27-135 Post-Development Final (R1-1)

Type III 24-hr 2-Year Rainfall=3.60"

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

Page 11

Pond P17: Infiltration ChambersPeak Elev=60.50' Storage=54 cf Inflow=0.08 cfs 0.007 af
Outflow=0.02 cfs 0.007 af**Pond P18: Infiltration Chambers**Peak Elev=60.50' Storage=54 cf Inflow=0.08 cfs 0.007 af
Outflow=0.02 cfs 0.007 af**Pond P2: Infiltration Chambers**Peak Elev=57.25' Storage=912 cf Inflow=1.20 cfs 0.098 af
Outflow=0.27 cfs 0.098 af**Pond P3: Infiltration Chambers**Peak Elev=57.11' Storage=55 cf Inflow=0.08 cfs 0.007 af
Outflow=0.02 cfs 0.007 af**Pond P4: Infiltration Chambers**Peak Elev=57.10' Storage=55 cf Inflow=0.08 cfs 0.007 af
Outflow=0.02 cfs 0.007 af**Pond P5: Infiltration Chambers**Peak Elev=56.95' Storage=77 cf Inflow=0.13 cfs 0.011 af
Outflow=0.04 cfs 0.011 af**Pond P6: Infiltration Chambers**Peak Elev=60.25' Storage=34 cf Inflow=0.07 cfs 0.005 af
Outflow=0.02 cfs 0.005 af**Pond P7: Infiltration Chambers**Peak Elev=60.50' Storage=55 cf Inflow=0.08 cfs 0.007 af
Outflow=0.02 cfs 0.007 af**Pond P8: Infiltration Chambers**Peak Elev=60.50' Storage=55 cf Inflow=0.08 cfs 0.007 af
Outflow=0.02 cfs 0.007 af**Pond P9: Infiltration Chambers**Peak Elev=60.51' Storage=55 cf Inflow=0.08 cfs 0.007 af
Outflow=0.02 cfs 0.007 af**Pond W1: BVW**Peak Elev=56.02' Storage=101 cf Inflow=1.18 cfs 0.091 af
Outflow=1.15 cfs 0.091 af**Total Runoff Area = 7.418 ac Runoff Volume = 0.884 af Average Runoff Depth = 1.43"**
45.06% Pervious = 3.342 ac 54.94% Impervious = 4.076 ac

Summary for Subcatchment 1S: Sub-1

Runoff = 0.25 cfs @ 12.10 hrs, Volume= 0.020 af, Depth= 0.91"

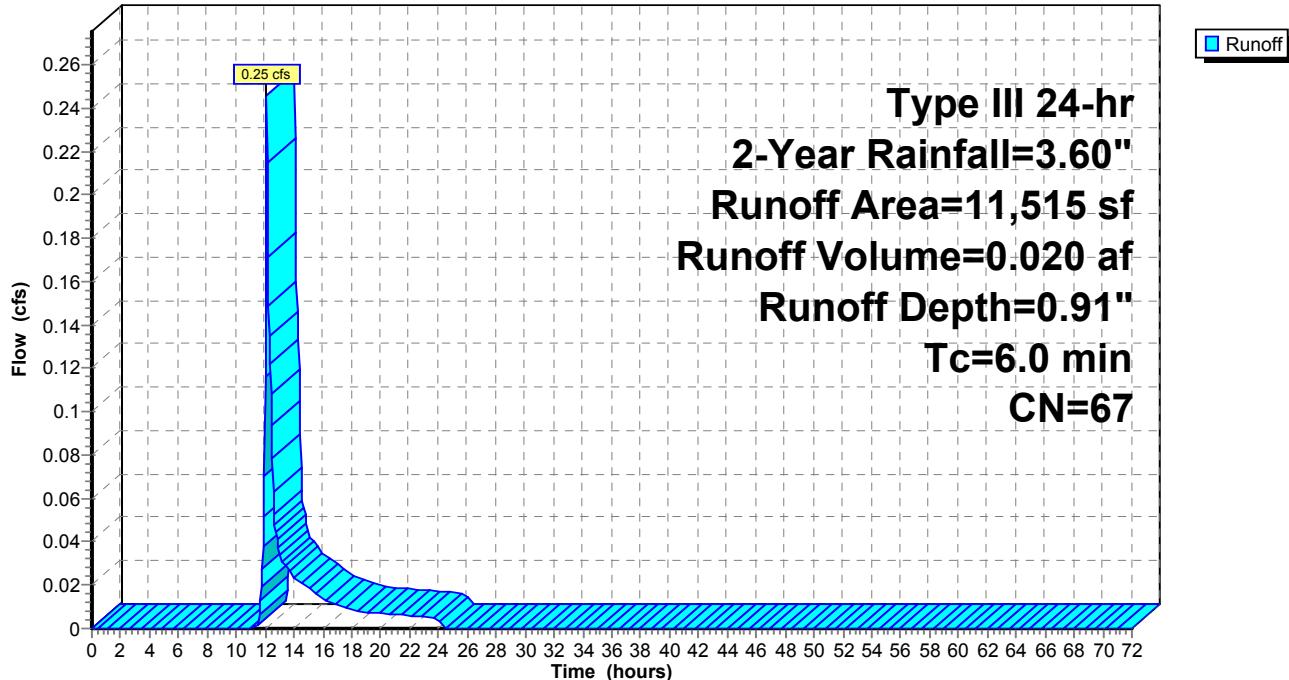
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
*		
5,498	98	Paved roads w/curbs & sewers, HSG A
6,017	39	>75% Grass cover, Good, HSG A
11,515	67	Weighted Average
6,017		52.25% Pervious Area
5,498		47.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Sub-1

Hydrograph



Summary for Subcatchment 2S: Sub-2

Runoff = 0.00 cfs @ 14.81 hrs, Volume= 0.001 af, Depth= 0.08"

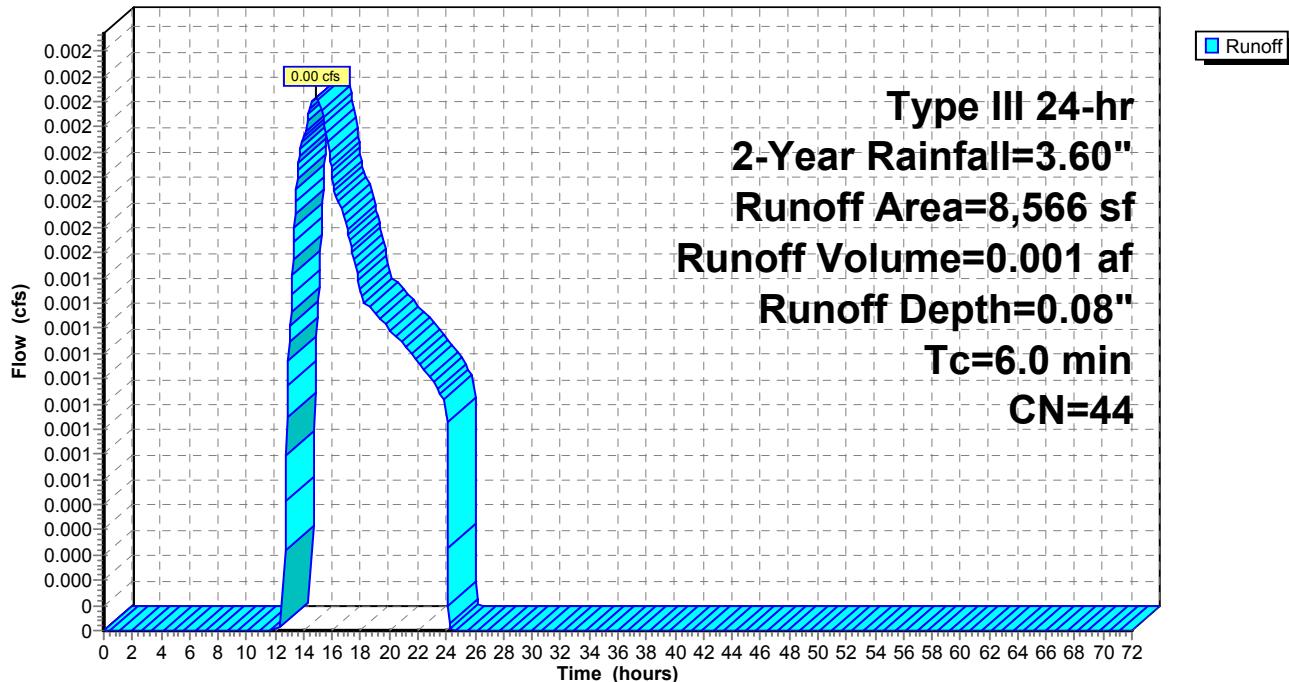
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
7,754	39	>75% Grass cover, Good, HSG A
*	100	Walls, HSG A
*	570	Decks, HSG A
	142	>75% Grass cover, Good, HSG A
8,566	44	Weighted Average
7,896		92.18% Pervious Area
670		7.82% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 2S: Sub-2

Hydrograph



Summary for Subcatchment 3A-10R: Roofs 15 B

Runoff = 0.07 cfs @ 12.09 hrs, Volume= 0.006 af, Depth= 3.37"

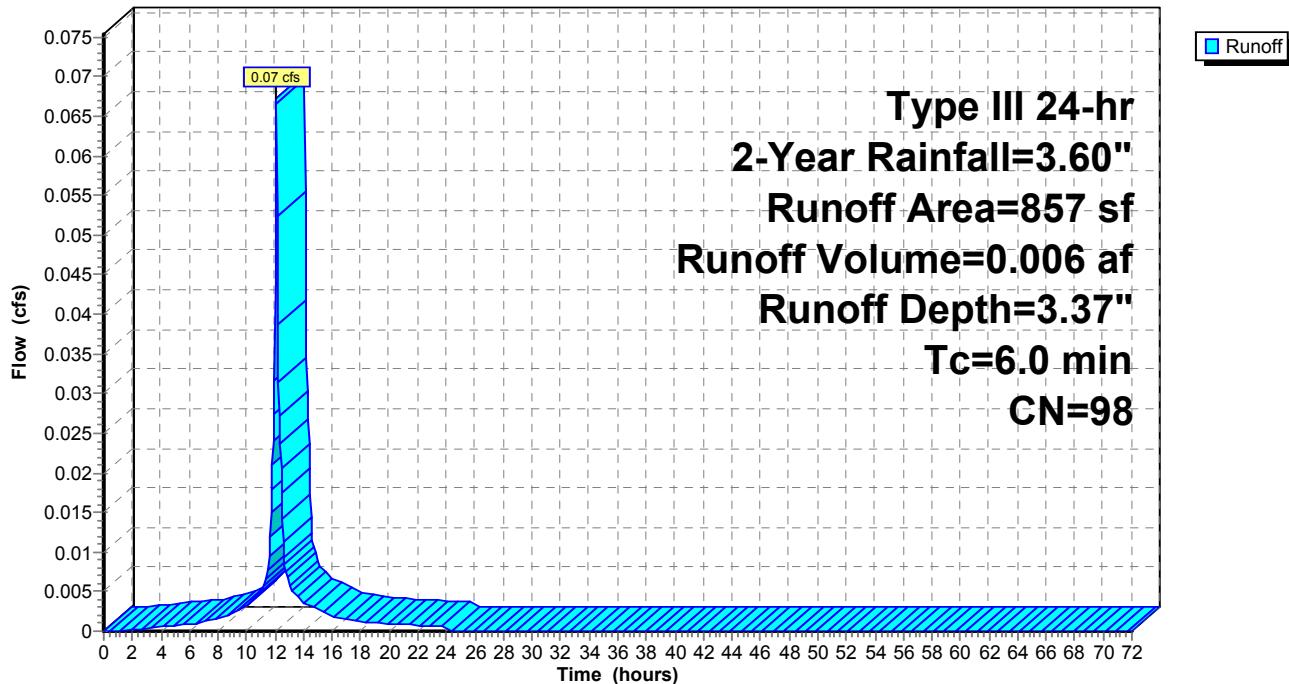
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
857	98	Roofs, HSG A
857		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-10R: Roofs 15 B

Hydrograph



Summary for Subcatchment 3A-10R1: Roofs 15 F

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 3.37"

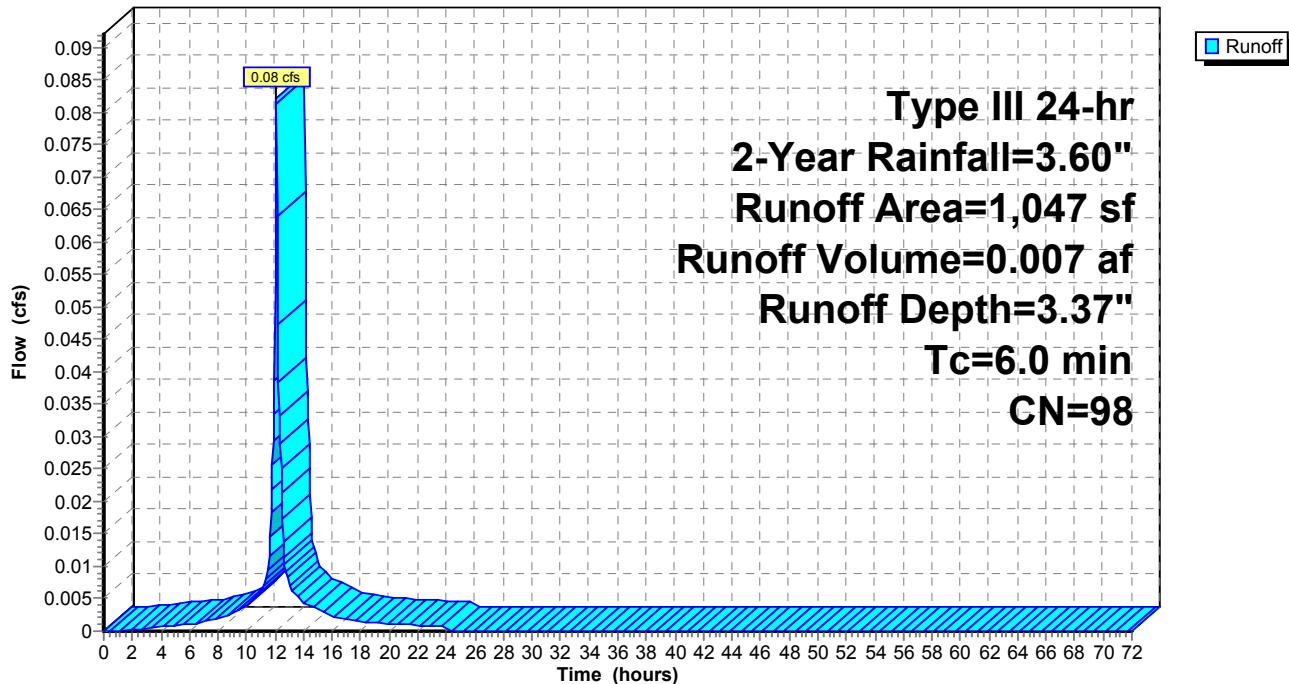
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
1,047	98	Roofs, HSG A
1,047		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-10R1: Roofs 15 F

Hydrograph



Summary for Subcatchment 3A-11R: Roofs 16-17 FB

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.025 af, Depth= 3.37"

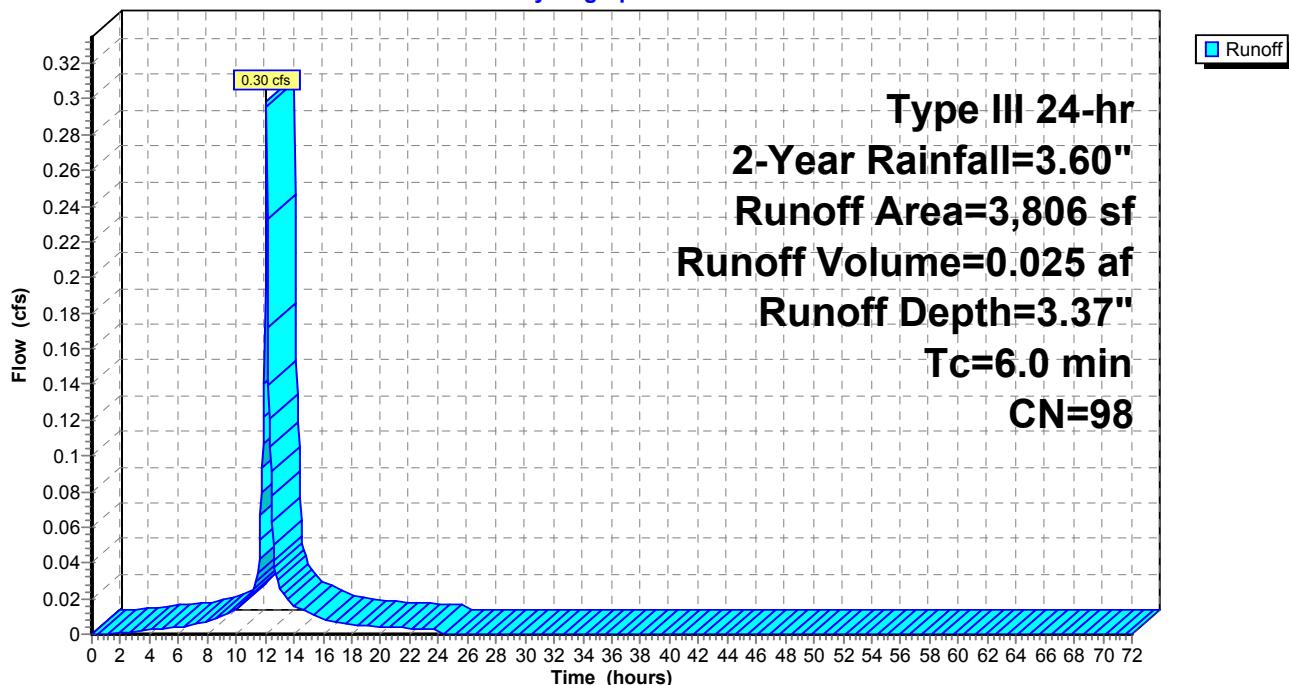
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
3,806	98	Roofs, HSG A
3,806		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-11R: Roofs 16-17 FB

Hydrograph



Summary for Subcatchment 3A-12R: Roofs 18-21 F

Runoff = 0.33 cfs @ 12.09 hrs, Volume= 0.027 af, Depth= 3.37"

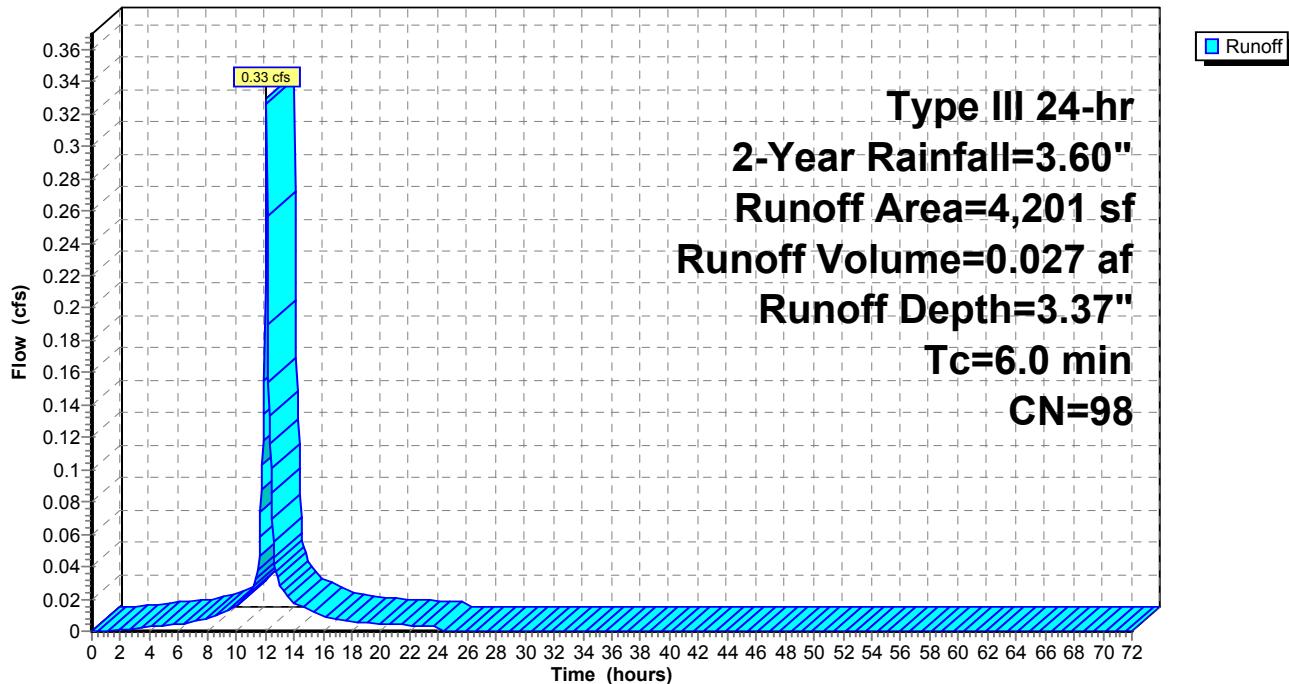
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
4,201	98	Roofs, HSG A
4,201		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-12R: Roofs 18-21 F

Hydrograph



Summary for Subcatchment 3A-12R1: Roofs 22-24 F

Runoff = 0.25 cfs @ 12.09 hrs, Volume= 0.020 af, Depth= 3.37"

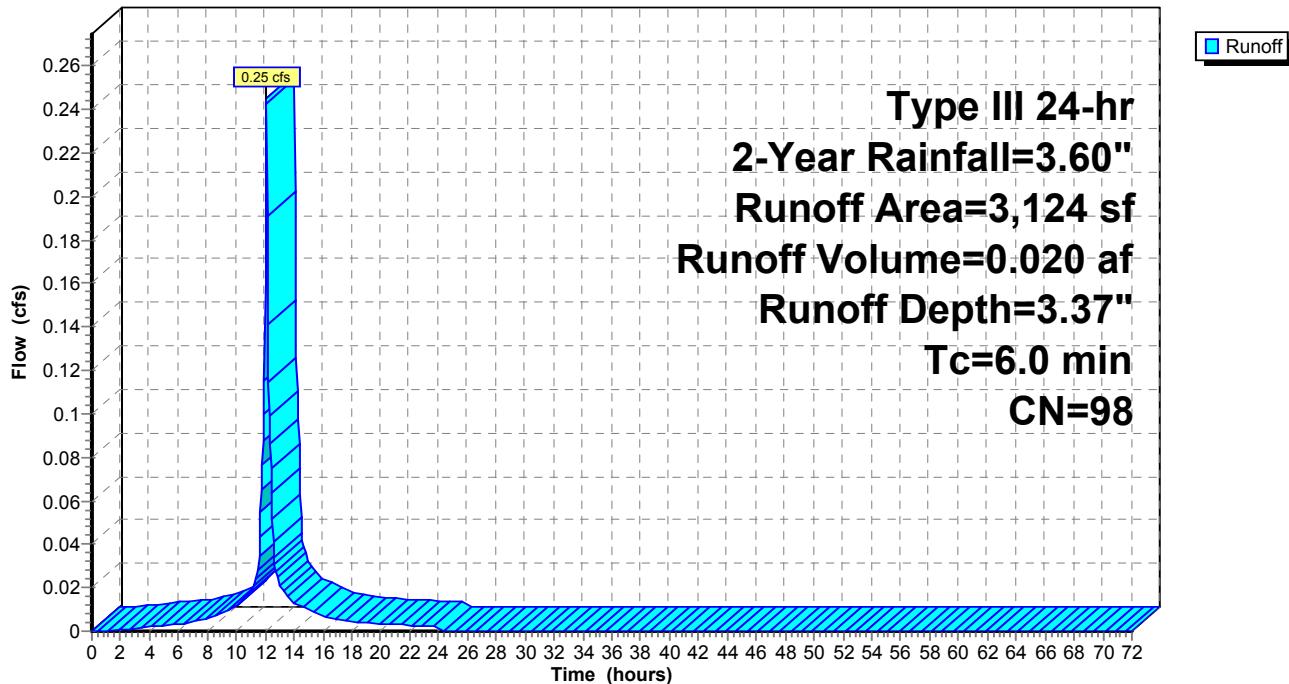
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
3,124	98	Roofs, HSG A
3,124		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-12R1: Roofs 22-24 F

Hydrograph



Summary for Subcatchment 3A-14R: Roofs 25-28 F

Runoff = 0.33 cfs @ 12.09 hrs, Volume= 0.027 af, Depth= 3.37"

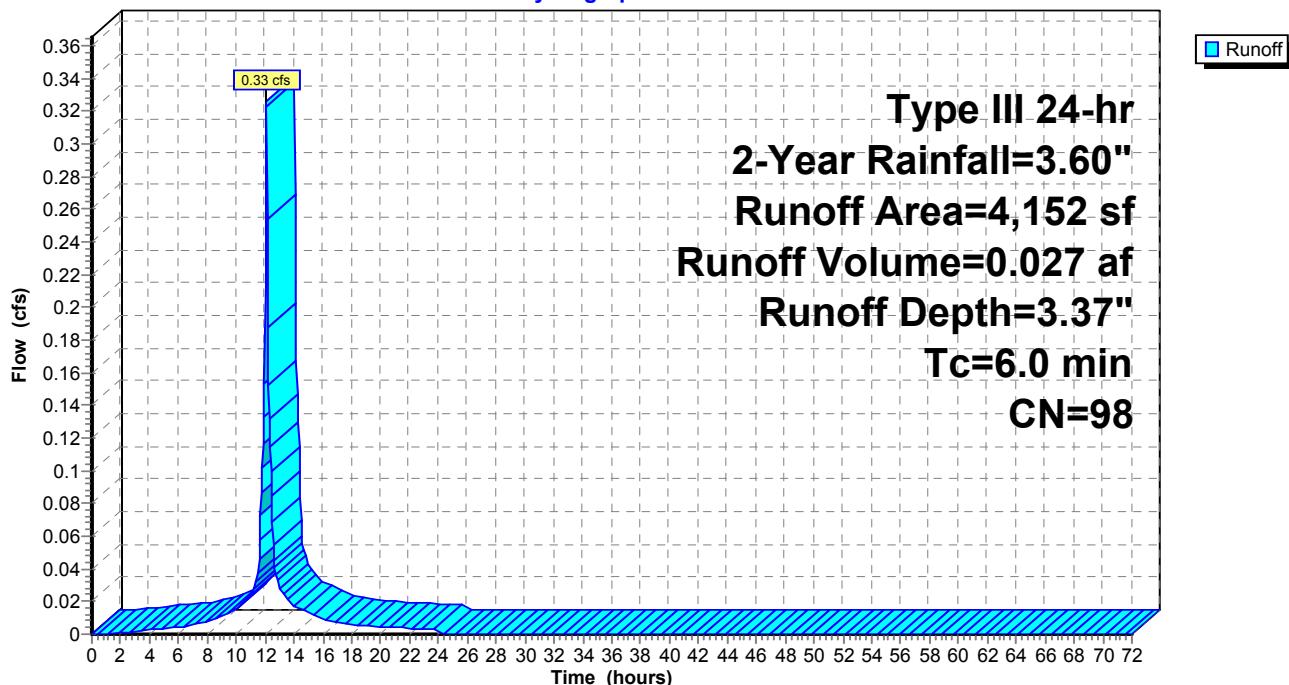
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
4,152	98	Roofs, HSG A
4,152		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R: Roofs 25-28 F

Hydrograph



Summary for Subcatchment 3A-14R1: Roofs 29-30 B

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 3.37"

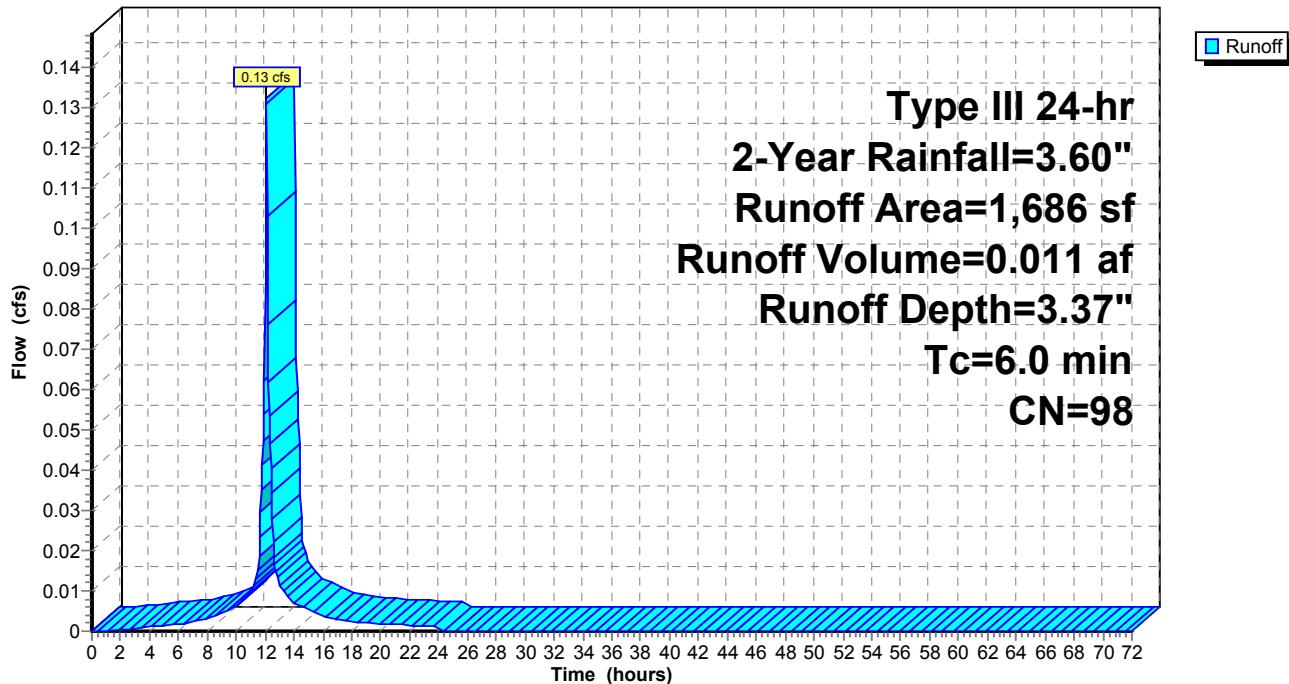
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
1,686	98	Roofs, HSG A
1,686		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R1: Roofs 29-30 B

Hydrograph



Summary for Subcatchment 3A-14R2: Roofs 31-32 B

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 3.37"

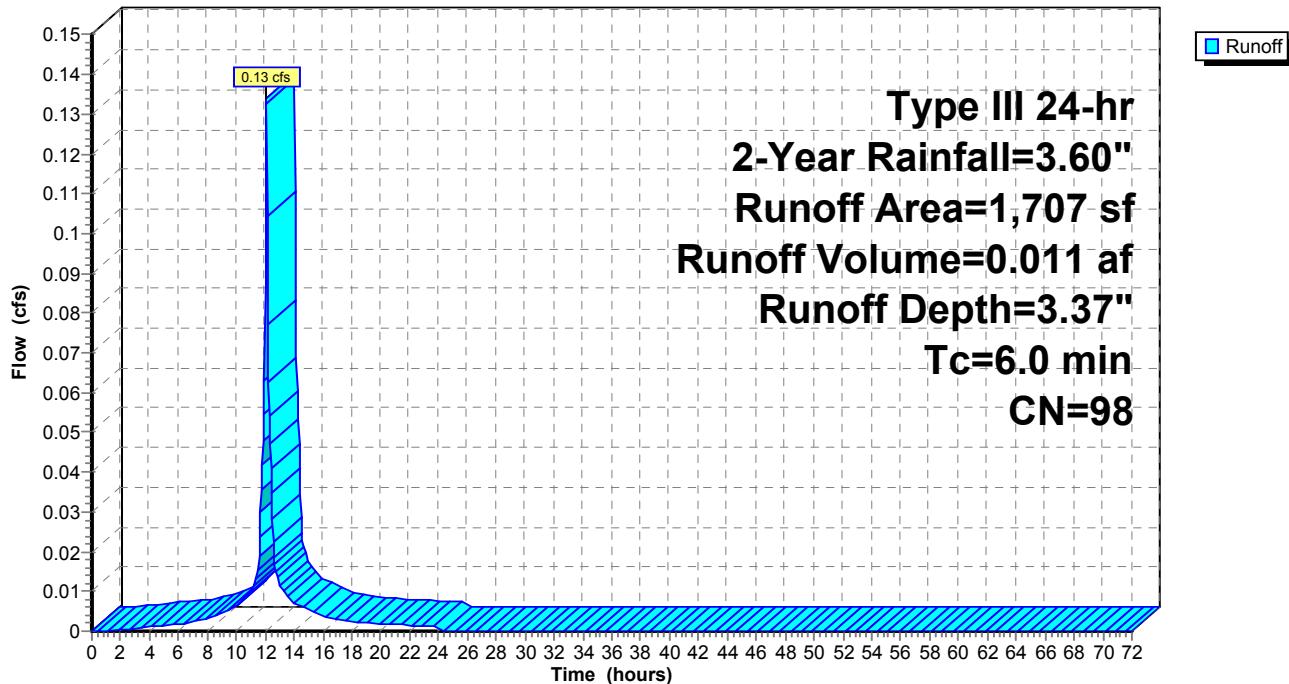
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
1,707	98	Roofs, HSG A
1,707		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R2: Roofs 31-32 B

Hydrograph



Summary for Subcatchment 3A-15R: Roofs 29-30 F

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 3.37"

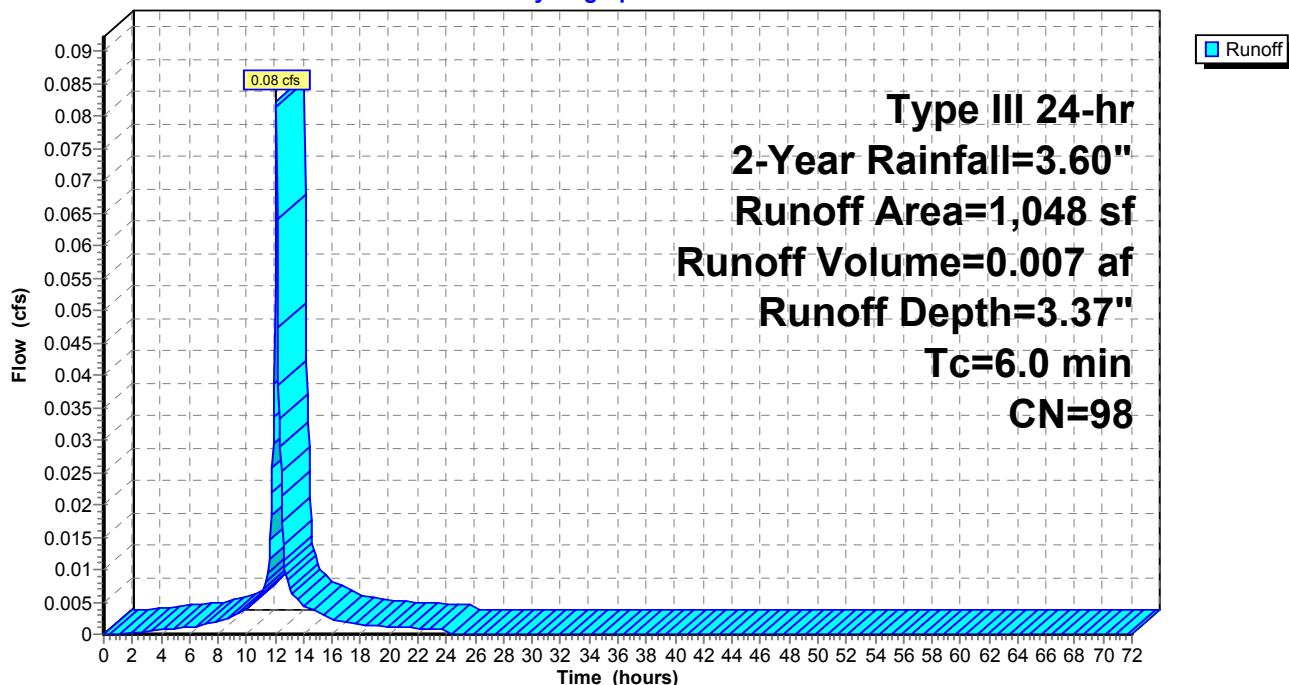
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
1,048	98	Roofs, HSG A
1,048		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-15R: Roofs 29-30 F

Hydrograph



Summary for Subcatchment 3A-16R: Roofs 29-30 F

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 3.37"

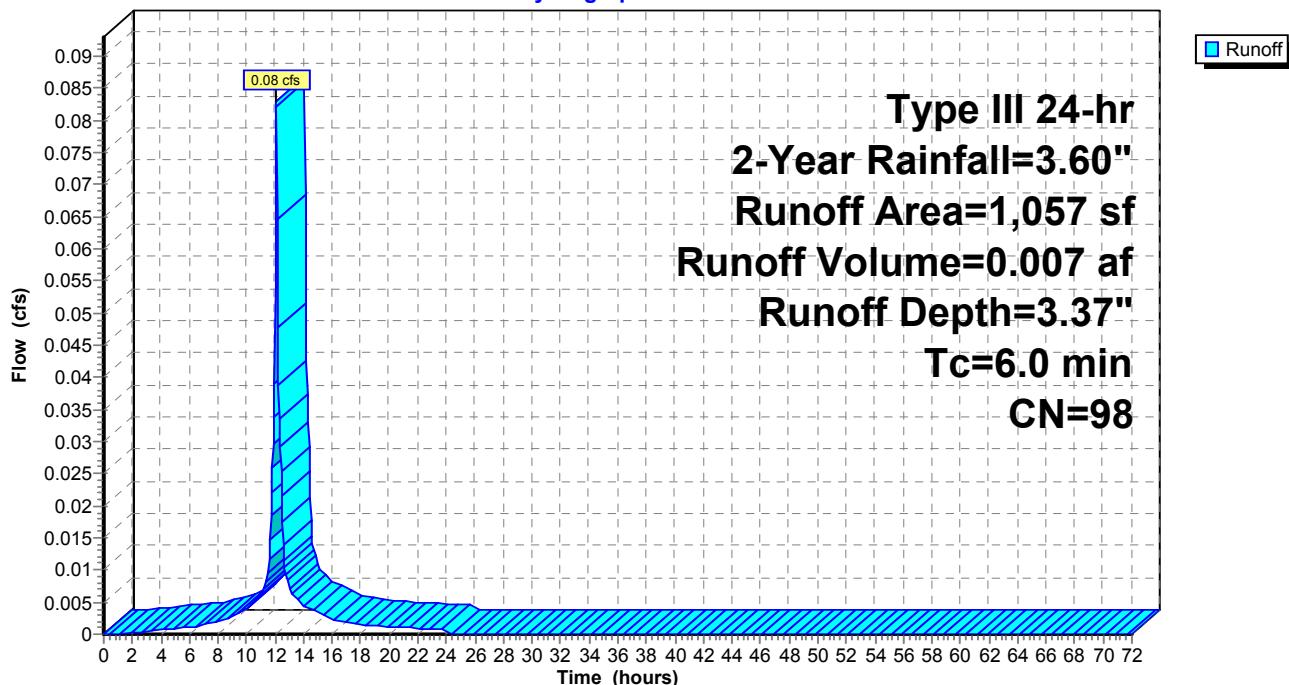
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
1,057	98	Roofs, HSG A
1,057		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-16R: Roofs 29-30 F

Hydrograph



Summary for Subcatchment 3A-17R: Roofs 31-32 F

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 3.37"

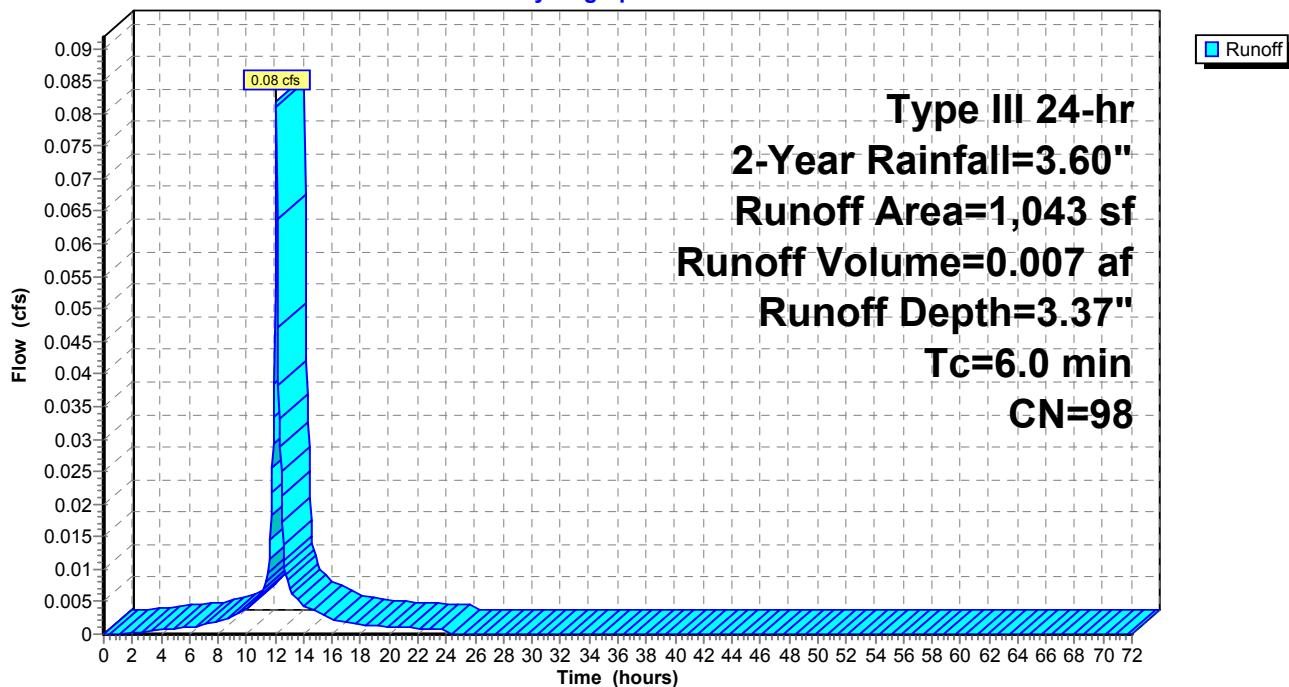
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
1,043	98	Roofs, HSG A
1,043		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-17R: Roofs 31-32 F

Hydrograph



Summary for Subcatchment 3A-18R: Roofs 31-32 F

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 3.37"

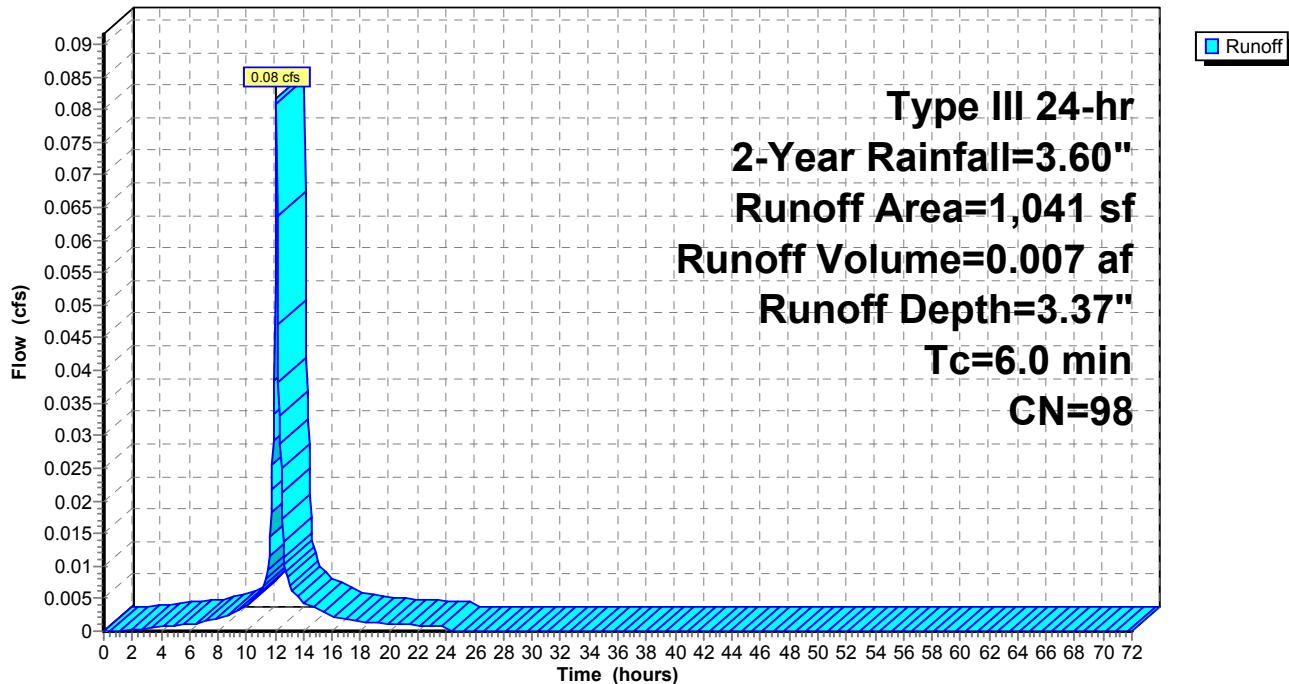
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
1,041	98	Roofs, HSG A
1,041		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-18R: Roofs 31-32 F

Hydrograph



Summary for Subcatchment 3A-1R: Roof 5

Runoff = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af, Depth= 3.37"

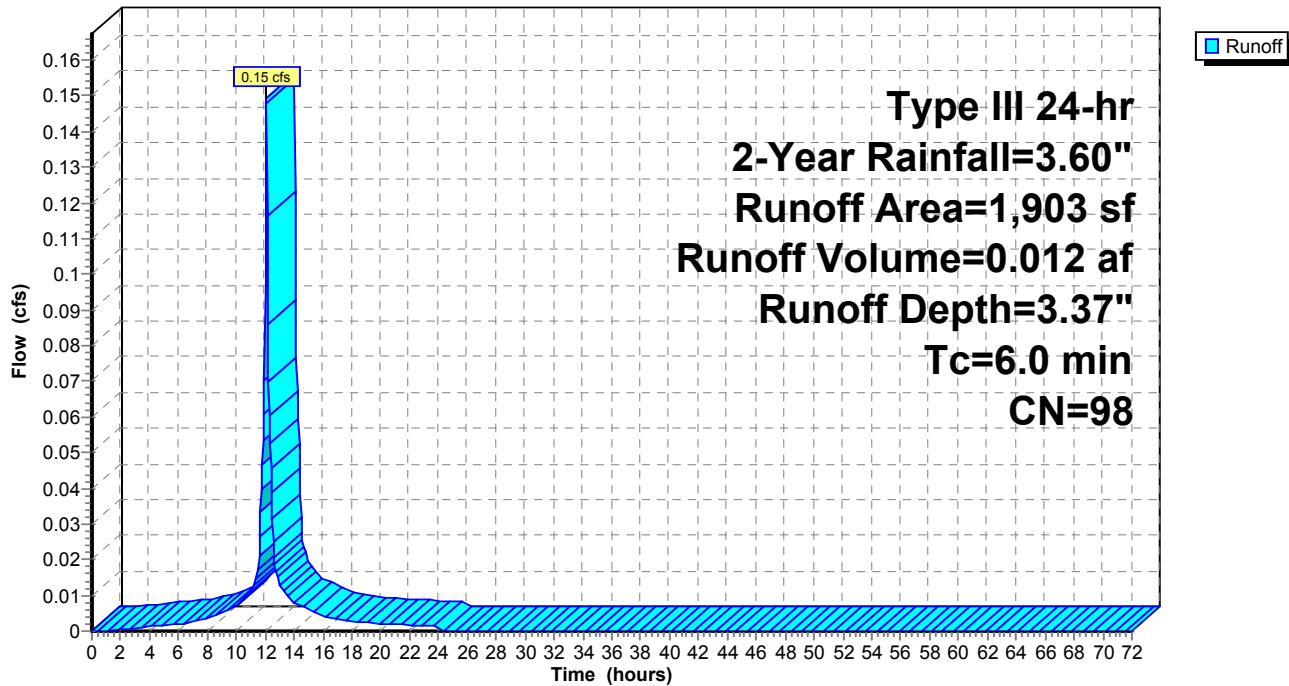
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
690	98	Roofs, HSG A
*	1,213	Roofs, HSG B
1,903	98	Weighted Average
1,903		100.00% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 3A-1R: Roof 5

Hydrograph



Summary for Subcatchment 3A-2R: Roofs 1-4 FB

Runoff = 0.60 cfs @ 12.09 hrs, Volume= 0.049 af, Depth= 3.37"

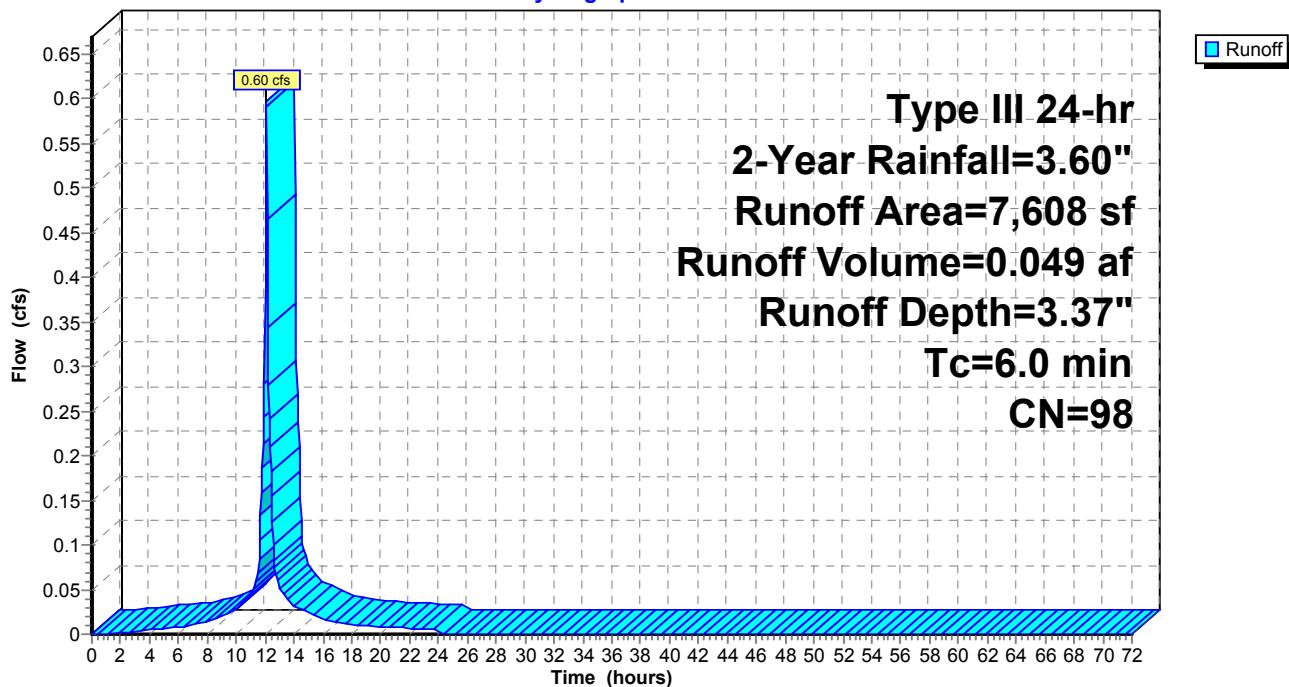
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
7,608	98	Roofs, HSG A
7,608		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-2R: Roofs 1-4 FB

Hydrograph



Summary for Subcatchment 3A-2R1: Roofs 6-9 FB

Runoff = 0.60 cfs @ 12.09 hrs, Volume= 0.049 af, Depth= 3.37"

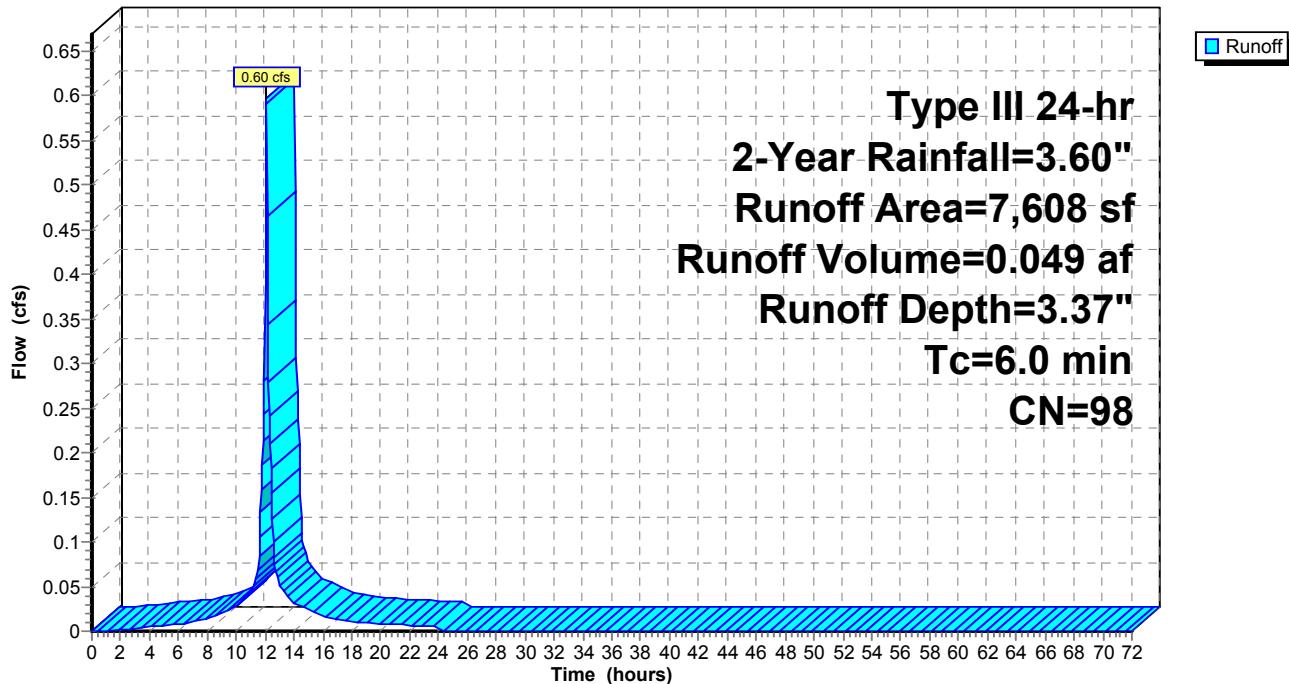
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
7,608	98	Roofs, HSG A
7,608		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-2R1: Roofs 6-9 FB

Hydrograph



Summary for Subcatchment 3A-3R: Roofs 10-F

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 3.37"

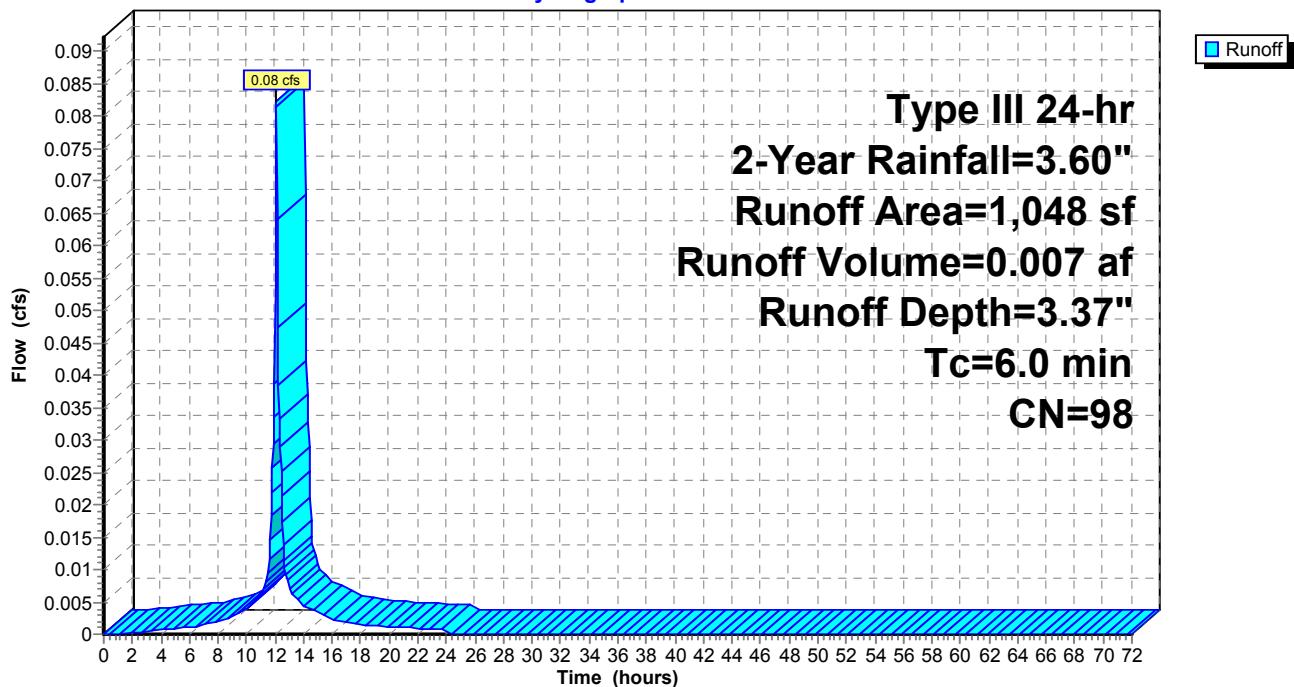
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

	Area (sf)	CN	Description
*	1,048	98	Roofs, HSG B
	1,048		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-3R: Roofs 10-F

Hydrograph



Summary for Subcatchment 3A-4R: Roofs 11 F

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 3.37"

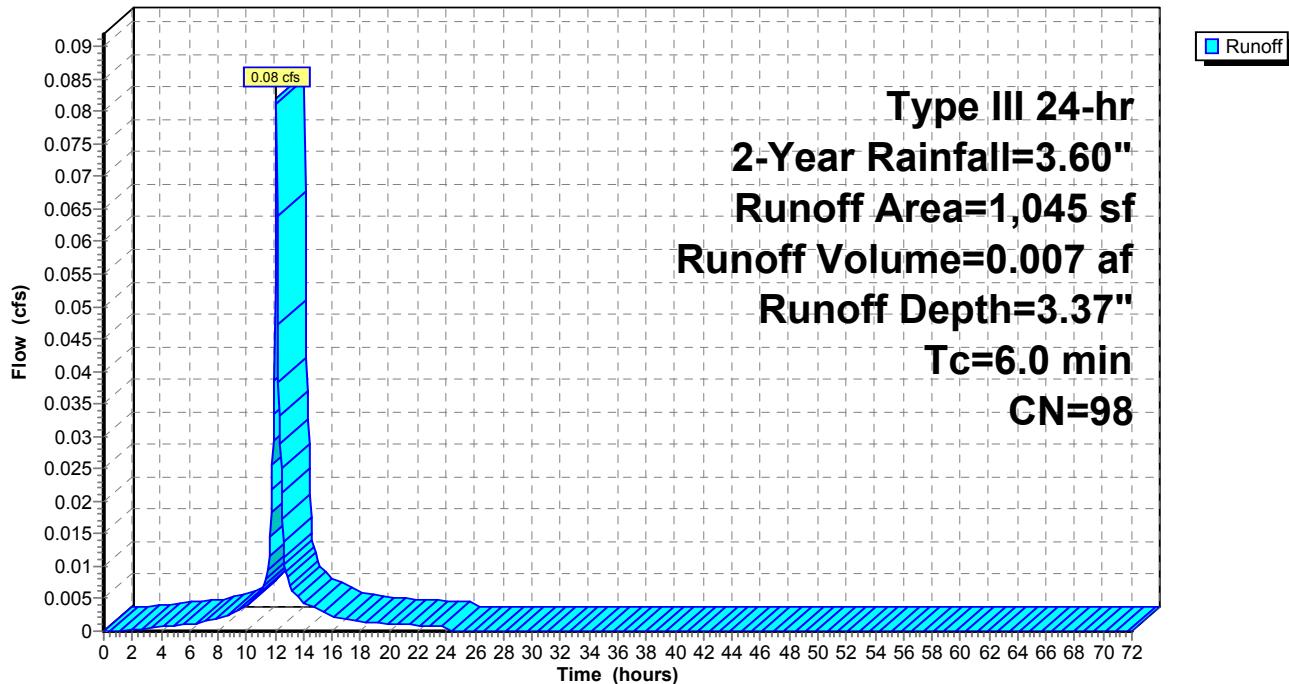
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

	Area (sf)	CN	Description
*	1,045	98	Roofs, HSG B
	1,045		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-4R: Roofs 11 F

Hydrograph



Summary for Subcatchment 3A-5R: Roofs 10-11 B

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 3.37"

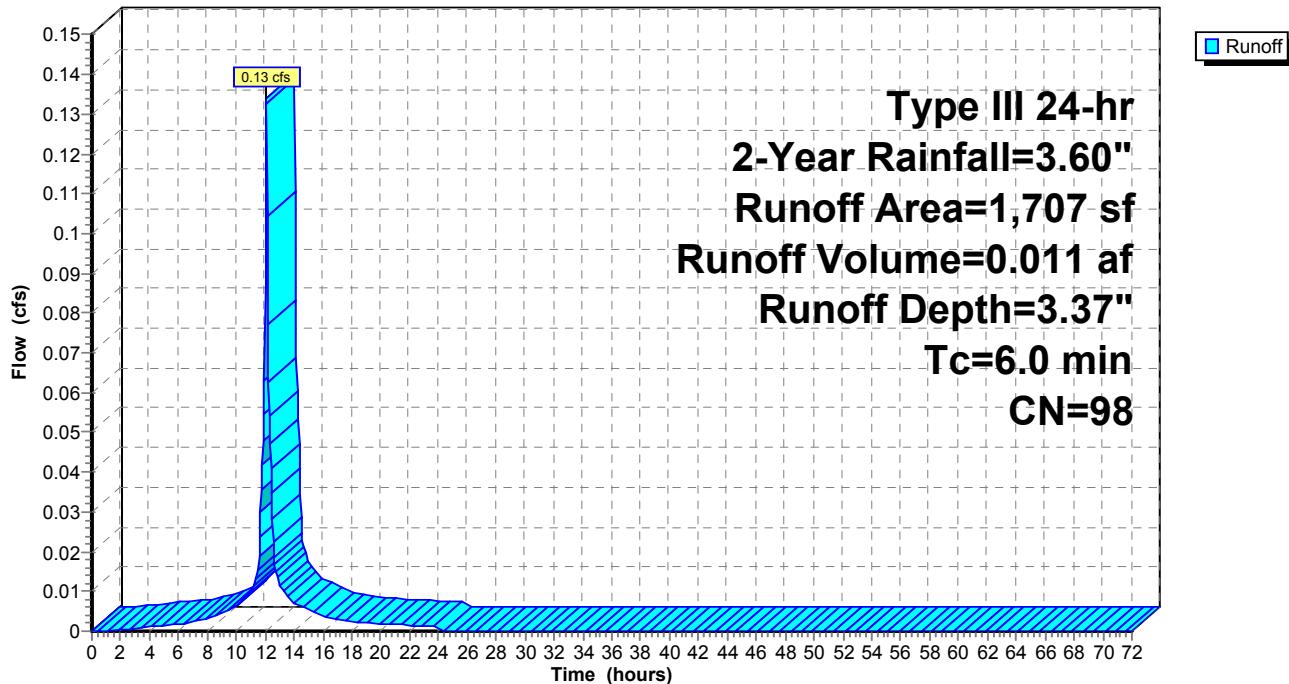
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
* 1,707	98	Roofs, HSG B
1,707		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-5R: Roofs 10-11 B

Hydrograph



Summary for Subcatchment 3A-6R: Roofs 12 B

Runoff = 0.07 cfs @ 12.09 hrs, Volume= 0.005 af, Depth= 3.37"

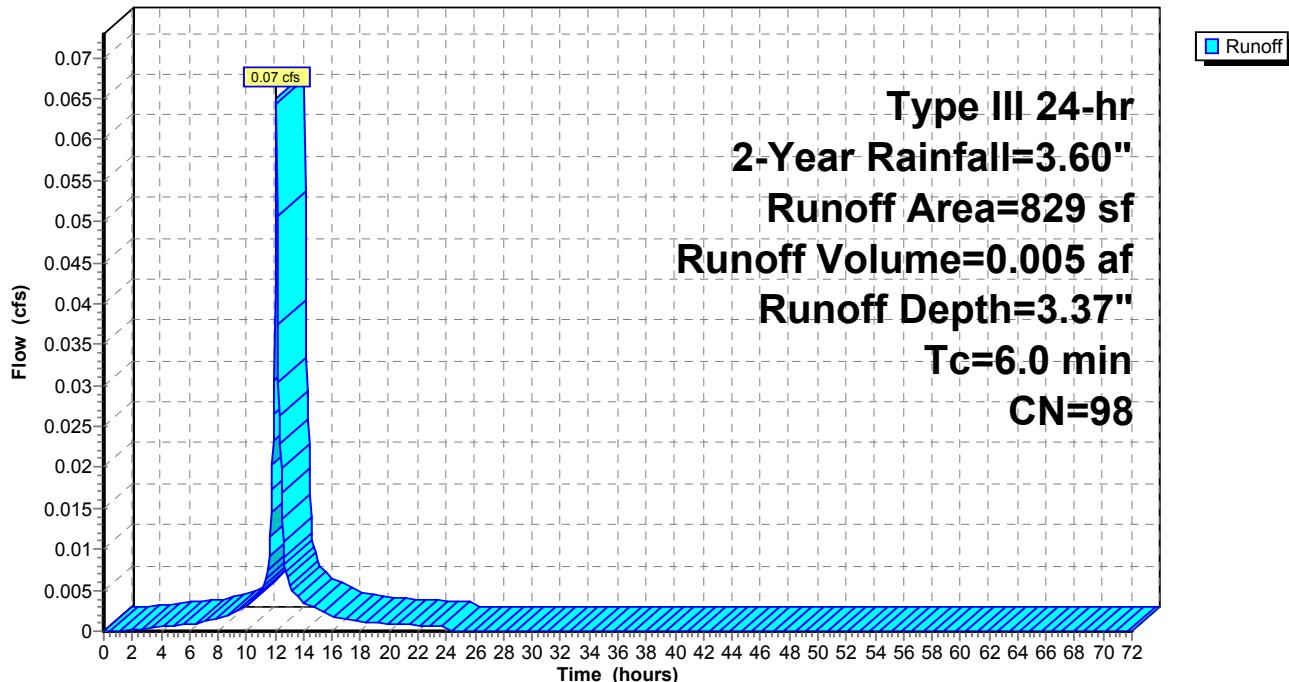
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

	Area (sf)	CN	Description
*	829	98	Roofs, HSG B
	829		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-6R: Roofs 12 B

Hydrograph



Summary for Subcatchment 3A-7R: Roofs 12 F

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 3.37"

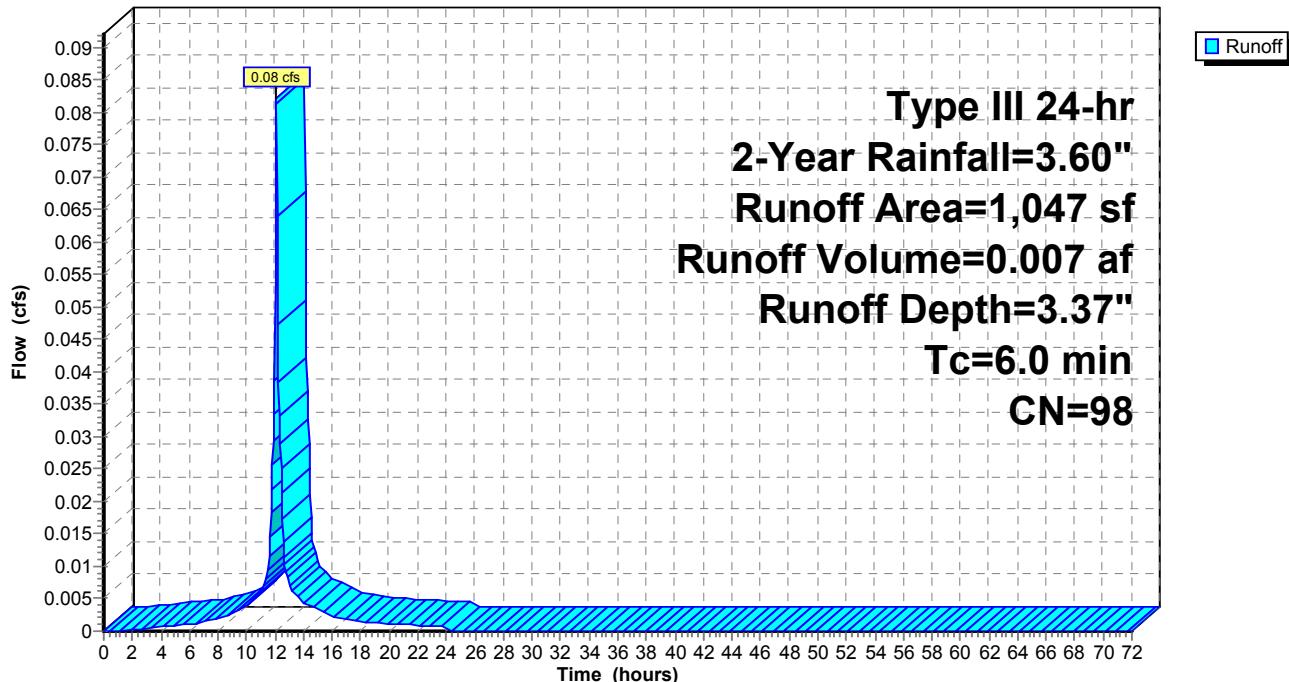
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

	Area (sf)	CN	Description
*	1,047	98	Roofs, HSG B
	1,047		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-7R: Roofs 12 F

Hydrograph



Summary for Subcatchment 3A-8R: Roofs 13 F

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 3.37"

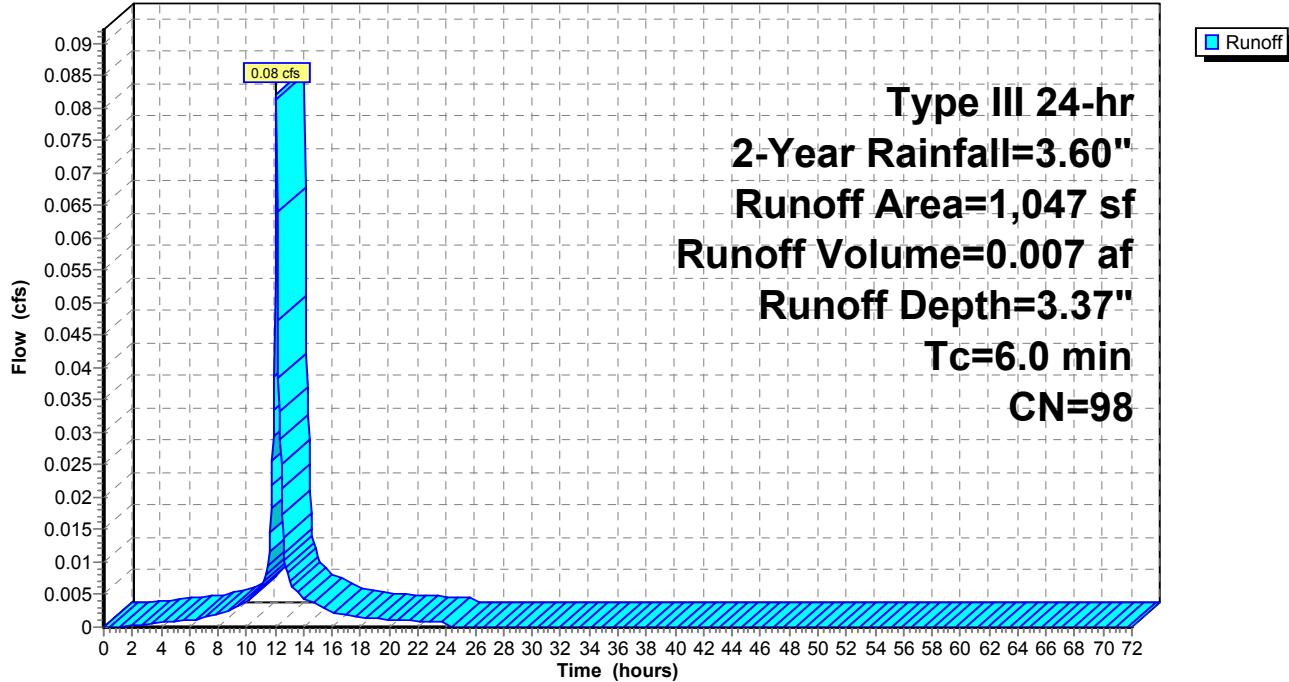
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
80	98	Roofs, HSG A
*	967	Roofs, HSG B
1,047	98	Weighted Average
1,047		100.00% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 3A-8R: Roofs 13 F

Hydrograph



Summary for Subcatchment 3A-9R: Roofs 14 F

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 3.37"

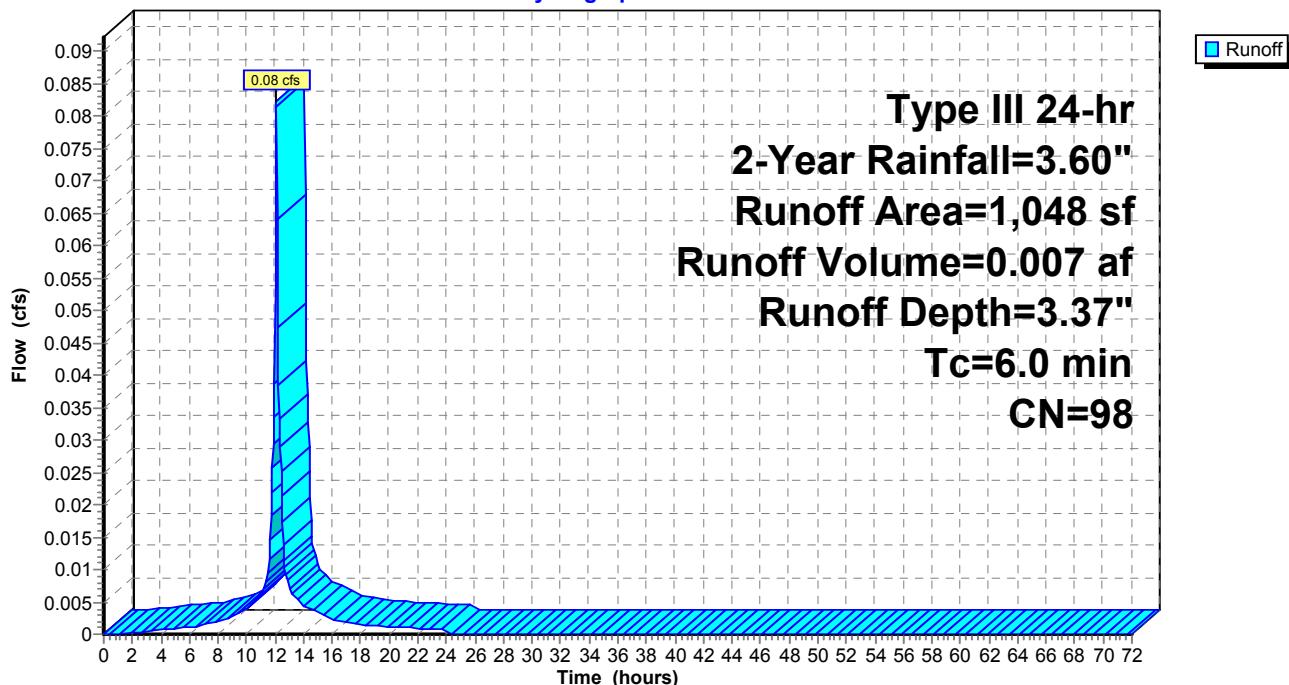
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
1,048	98	Roofs, HSG A
1,048		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-9R: Roofs 14 F

Hydrograph



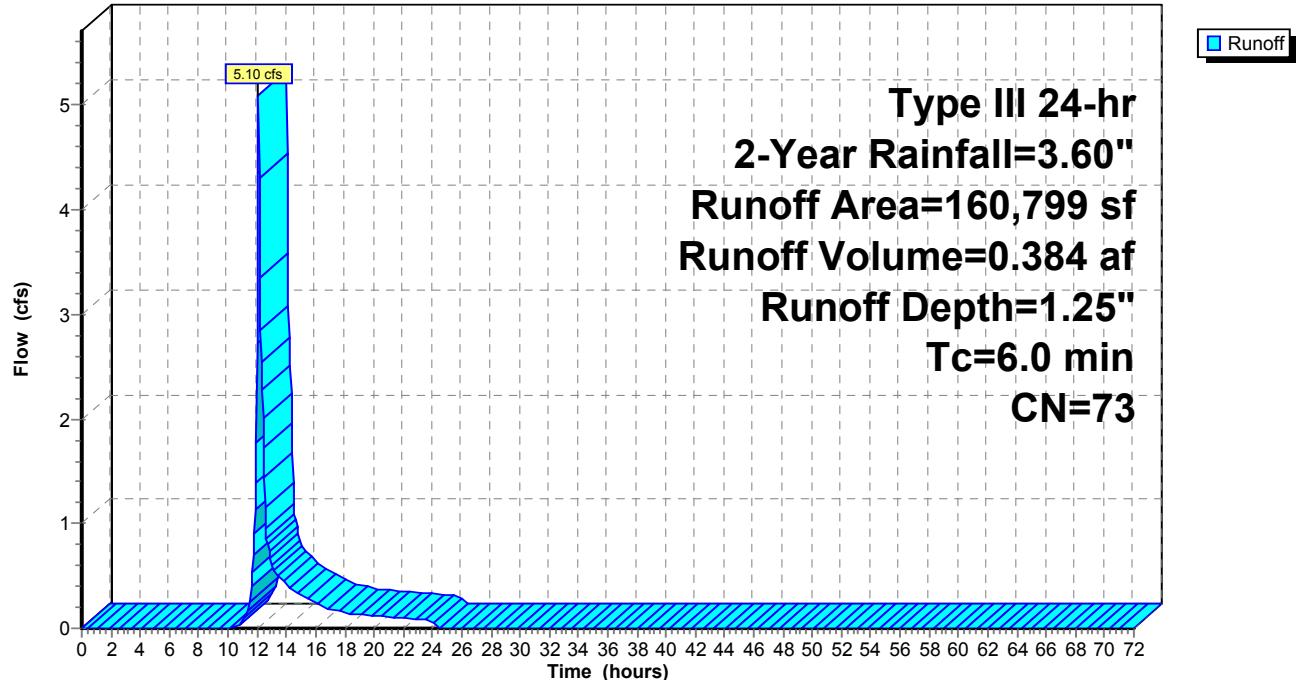
Summary for Subcatchment 3A-S: Sub-3A

Runoff = 5.10 cfs @ 12.10 hrs, Volume= 0.384 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
*	14,912	Paved drives, HSG A
*	2,050	Paved drives, HSG B
*	21,695	Paved roads w/curbs & sewers, HSG A
	8,853	Paved roads w/curbs & sewers, HSG B
*	3,012	Paved sidewalk, HSG A
*	986	Paved sidewalk. HSG B
*	1,189	Walks, HSG A
*	170	Walks, HSG B
*	922	Roofs, HSG A
*	874	Roofs, HSG B
*	2,352	Decks, HSG A
*	77	Decks, HSG B
*	7,626	Detention Basin, HSG A
*	4,140	Detention Basin, HSG B
55,493	39	>75% Grass cover, Good, HSG A
7,411	61	>75% Grass cover, Good, HSG B
2,714	98	Paved roads w/curbs & sewers, HSG A
*	474	Paved sidewalk, HSG A
*	103	Walls, HSG A
2,697	39	>75% Grass cover, Good, HSG A
*	1,384	Roofs, HSG A - offsite
16,069	98	Paved parking, HSG A - offsite
*	914	>75% Grass cover, Good, HSG A - offsite
*	1,682	Woods, Good, HSG A - offsite
*	3,000	Woods, Good, HSG A - offsite
160,799	73	Weighted Average
71,197		44.28% Pervious Area
89,602		55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

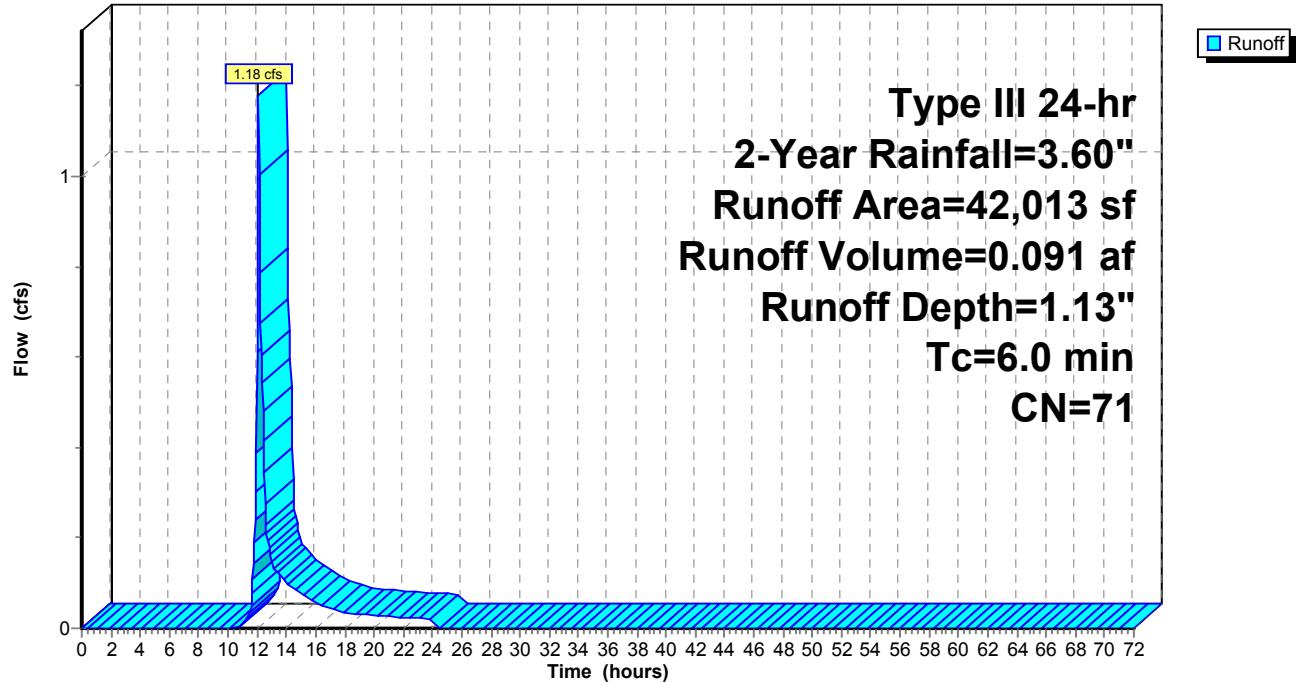
Subcatchment 3A-S: Sub-3A**Hydrograph**

Summary for Subcatchment 3B-S: Sub-3B

Runoff = 1.18 cfs @ 12.10 hrs, Volume= 0.091 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description		
10,864	55	Woods, Good, HSG B		
1,423	30	Woods, Good, HSG A		
*	15,816	98 Wetlands, HSG B		
	1,532	>75% Grass cover, Good, HSG A		
*	7,195	>75% Grass cover, Good, HSG B		
*	0	Roofs, HSG B		
*	666	Decks, HSG B		
*	418	Wetlands, HSG B - offsite		
*	62	Woods, Good, HSG A - offsite		
*	1,346	>75% Grass cover, Good, HSG A - offsite		
*	957	>75% Grass cover, Good, HSG B - offsite		
*	1,734	Woods, Good, HSG B - offsite		
42,013	71	Weighted Average		
25,113		59.77% Pervious Area		
16,900		40.23% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description		
6.0				Direct Entry,

Subcatchment 3B-S: Sub-3B**Hydrograph**

Summary for Subcatchment 3C-S: Sub-3C

Runoff = 0.09 cfs @ 12.15 hrs, Volume= 0.013 af, Depth= 0.42"

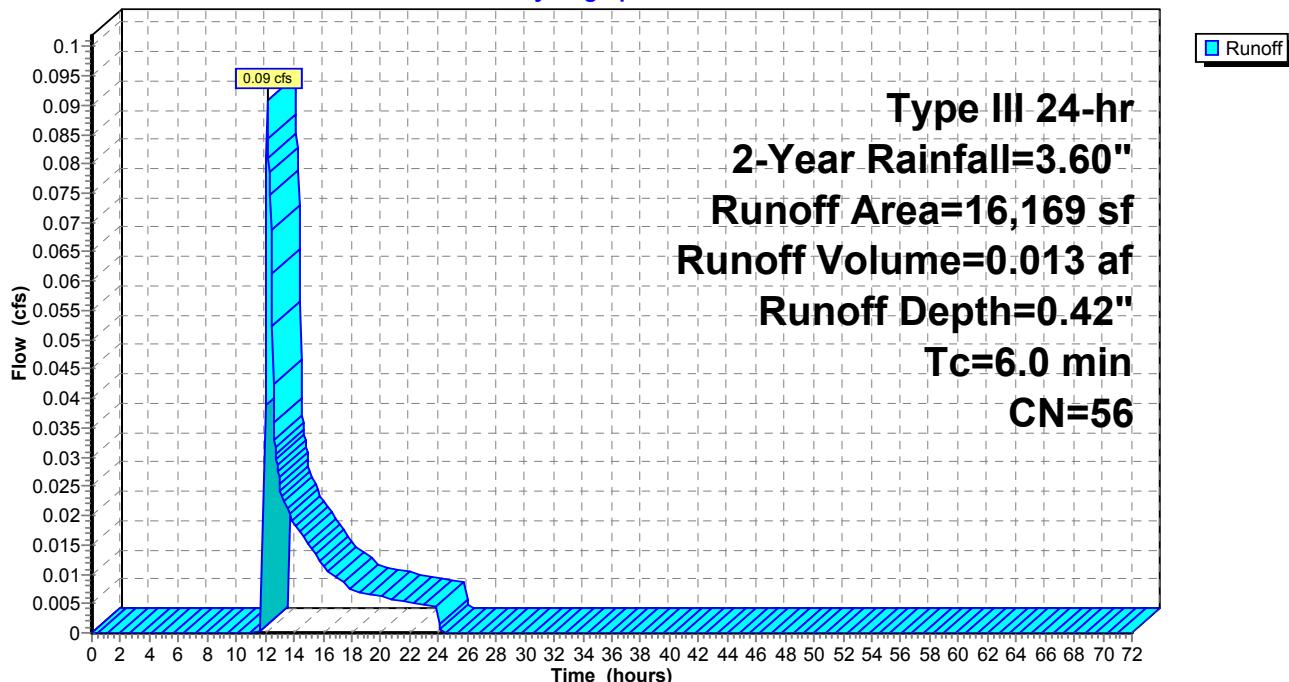
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

	Area (sf)	CN	Description
*	2,133	30	Woods, Good, HSG A - offsite
*	714	98	Paved roads w/curbs & sewers, HSG A - offsite
*	290	98	Paved drives, HSG A - offsite
*	2,061	39	>75% Grass cover, Good, HSG A - offsite
	4,666	61	>75% Grass cover, Good, HSG B
	4,041	39	>75% Grass cover, Good, HSG A
*	234	98	Paved sidewalk, HSG B
*	77	98	Paved sidewalk, HSG A
	1,600	98	Paved roads w/curbs & sewers, HSG B
*	75	98	Decks, HSG B
	278	98	Paved roads w/curbs & sewers, HSG A
	16,169	56	Weighted Average
	12,901		79.79% Pervious Area
	3,268		20.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 3C-S: Sub-3C

Hydrograph



Summary for Subcatchment 4S-1: Sub-4

Runoff = 0.14 cfs @ 12.12 hrs, Volume= 0.014 af, Depth= 0.62"

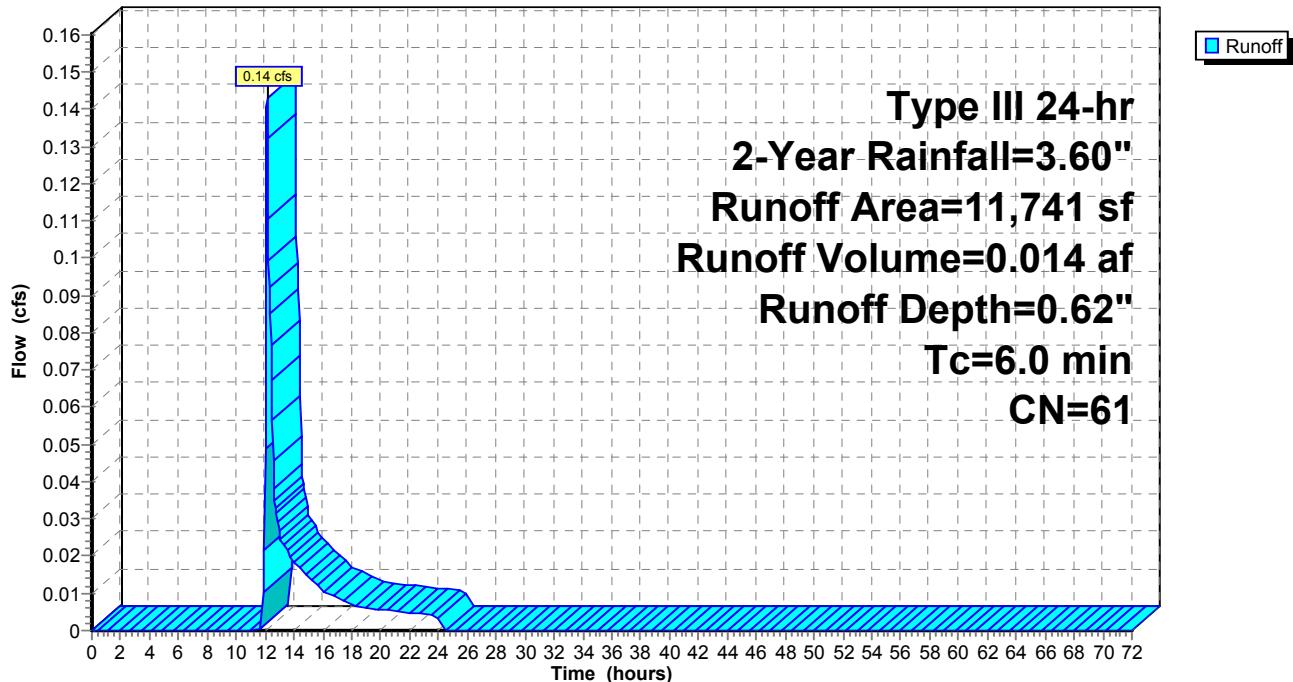
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
6,586	39	>75% Grass cover, Good, HSG A
* 942	98	Decks, HSG A
3,456	98	Roofs, HSG A
757	39	>75% Grass cover, Good, HSG A
11,741	61	Weighted Average
7,343		62.54% Pervious Area
4,398		37.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 4S-1: Sub-4

Hydrograph



Summary for Subcatchment 4S-1R: Roofs 22-24 B

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 3.37"

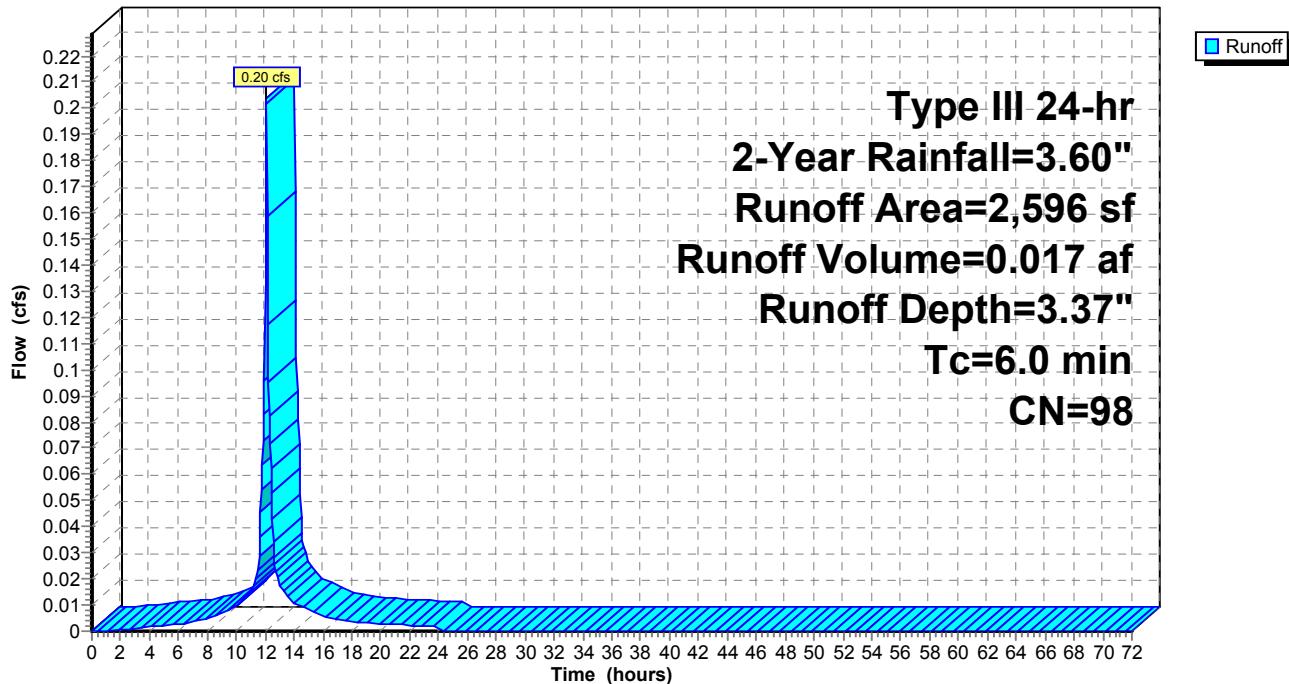
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
2,596	98	Roofs, HSG A
2,596		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 4S-1R: Roofs 22-24 B

Hydrograph



Summary for Subcatchment 4S-2: Sub-4

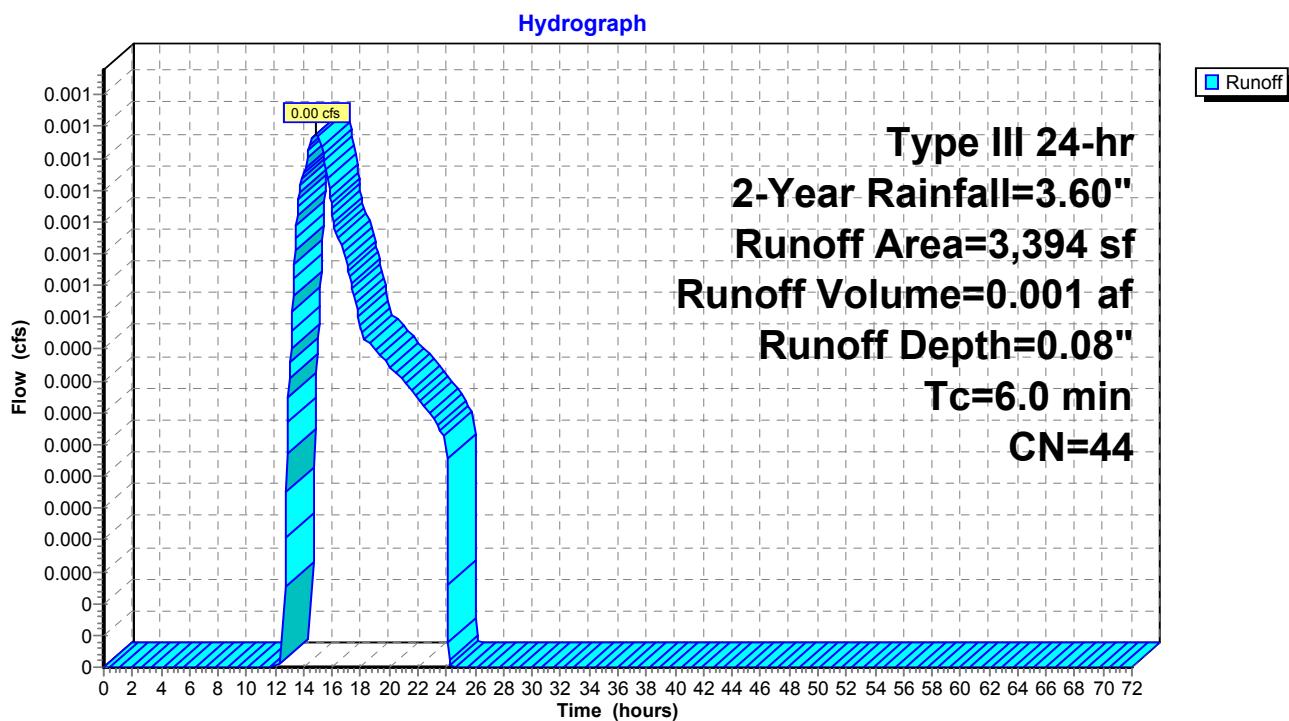
Runoff = 0.00 cfs @ 14.81 hrs, Volume= 0.001 af, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
3,083	39	>75% Grass cover, Good, HSG A
*	185	Decks, HSG A
*	126	Walls, HSG A
3,394	44	Weighted Average
3,083		90.84% Pervious Area
311		9.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 4S-2: Sub-4



Summary for Subcatchment 5S: Sub -5

Runoff = 0.00 cfs @ 14.57 hrs, Volume= 0.003 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

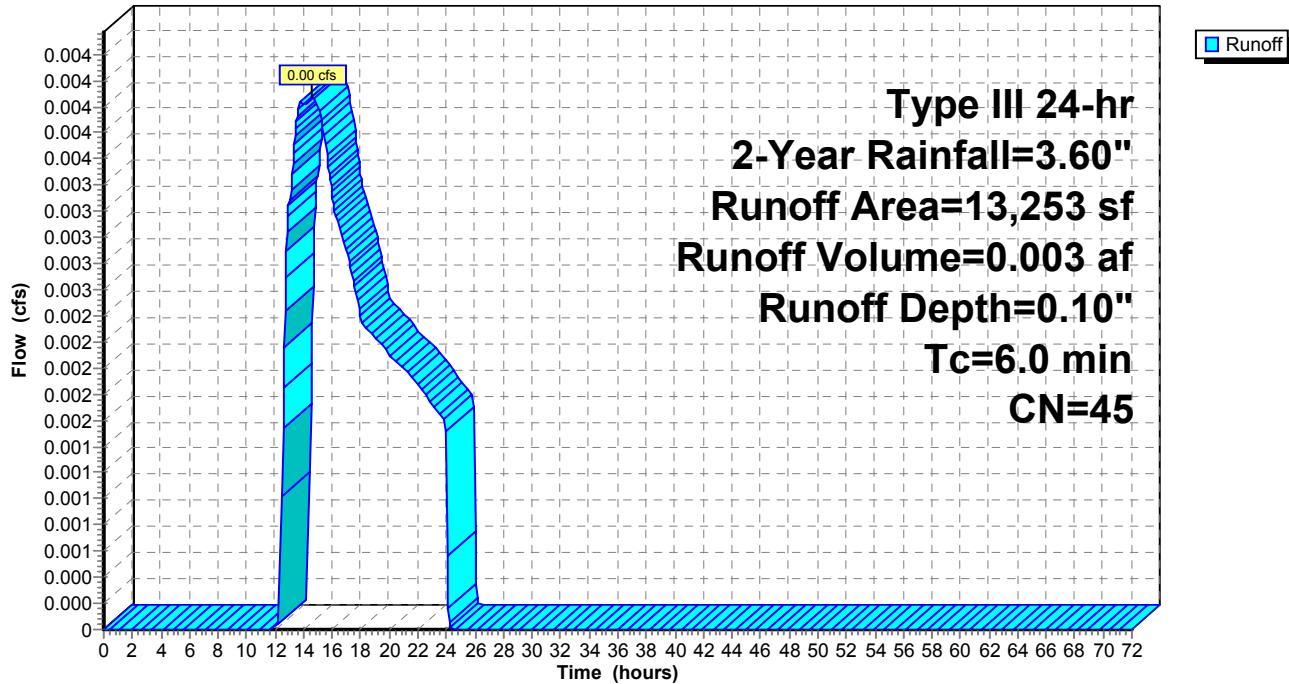
Area (sf)	CN	Description
11,396	39	>75% Grass cover, Good, HSG A
*	634	>75% Grass cover, Good, HSG D
*	14	Decks, HSG D
*	1,112	Decks, HSG A
*	40	Walls, HSG D
*	57	Walls, HSG A

13,253	45	Weighted Average
12,030		90.77% Pervious Area
1,223		9.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 5S: Sub -5

Hydrograph



Summary for Subcatchment 5S-1R: Roofs 18-21 B

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 0.022 af, Depth= 3.37"

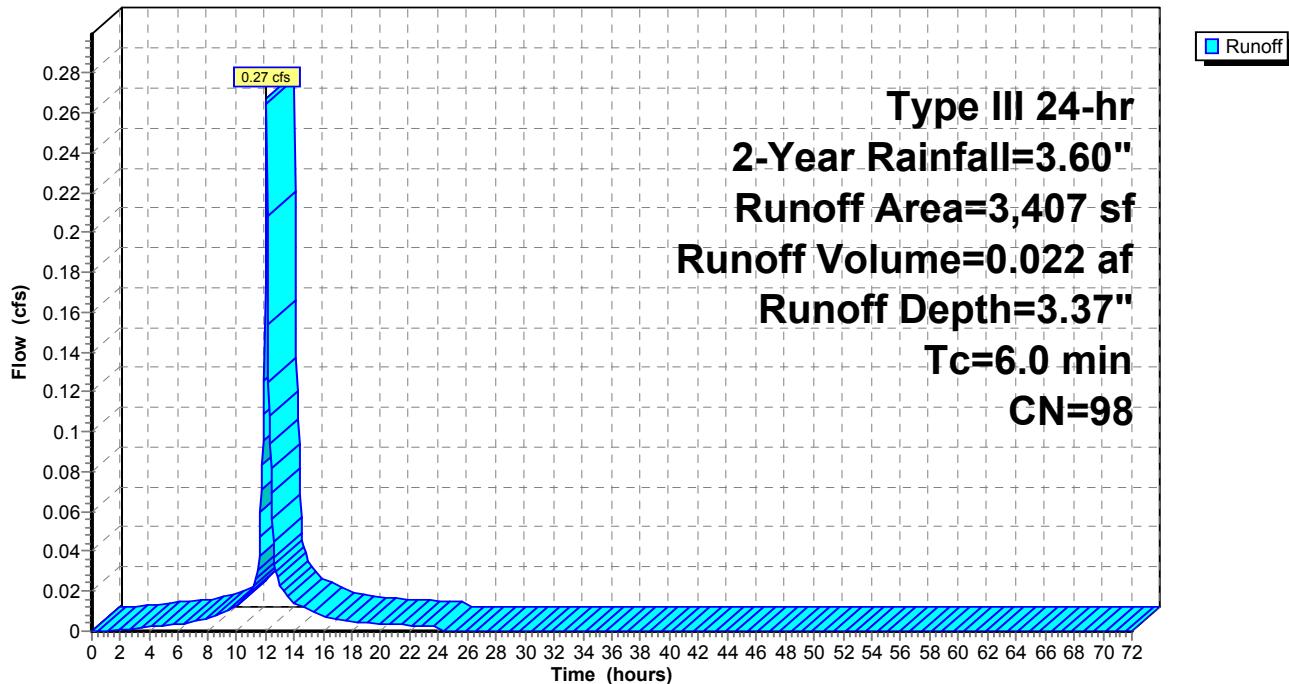
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.60"

Area (sf)	CN	Description
3,407	98	Roofs, HSG A
3,407		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 5S-1R: Roofs 18-21 B

Hydrograph



Summary for Reach DP-1: DMH

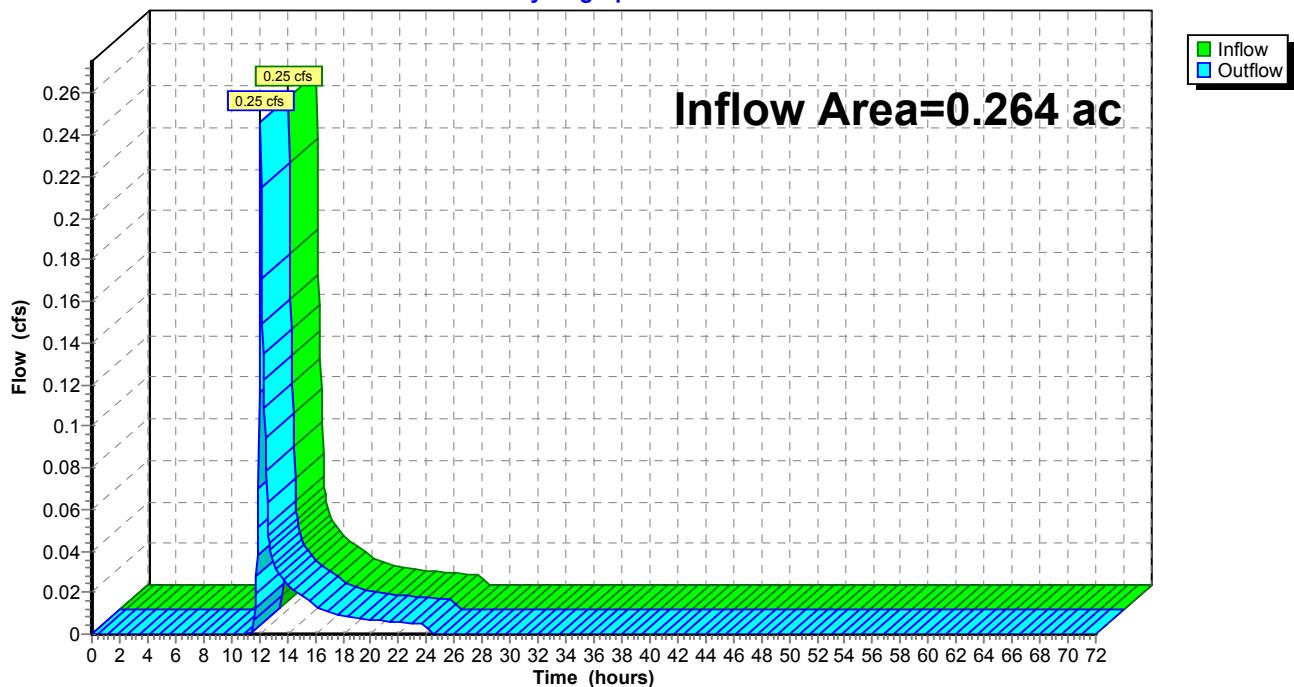
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.264 ac, 47.75% Impervious, Inflow Depth = 0.91" for 2-Year event
 Inflow = 0.25 cfs @ 12.10 hrs, Volume= 0.020 af
 Outflow = 0.25 cfs @ 12.10 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-1: DMH

Hydrograph



Summary for Reach DP-2: DP-2

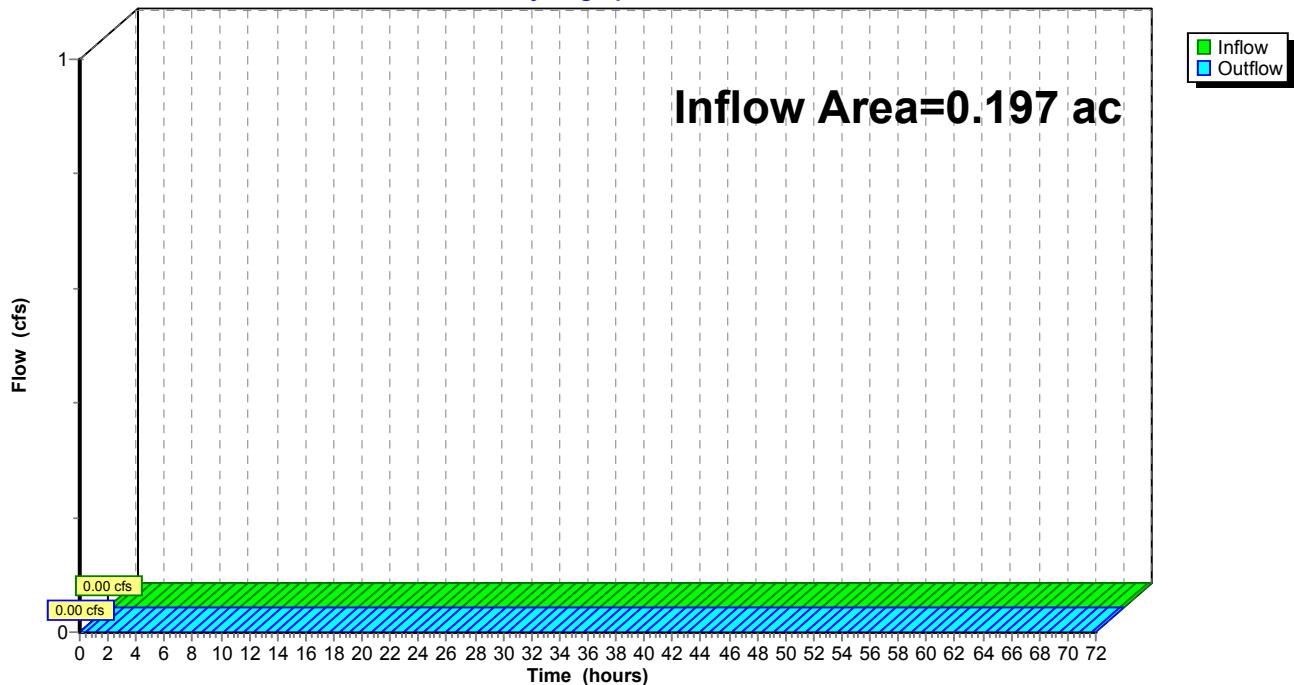
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.197 ac, 7.82% Impervious, Inflow Depth = 0.00" for 2-Year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-2: DP-2

Hydrograph



Summary for Reach DP-3: DP-3

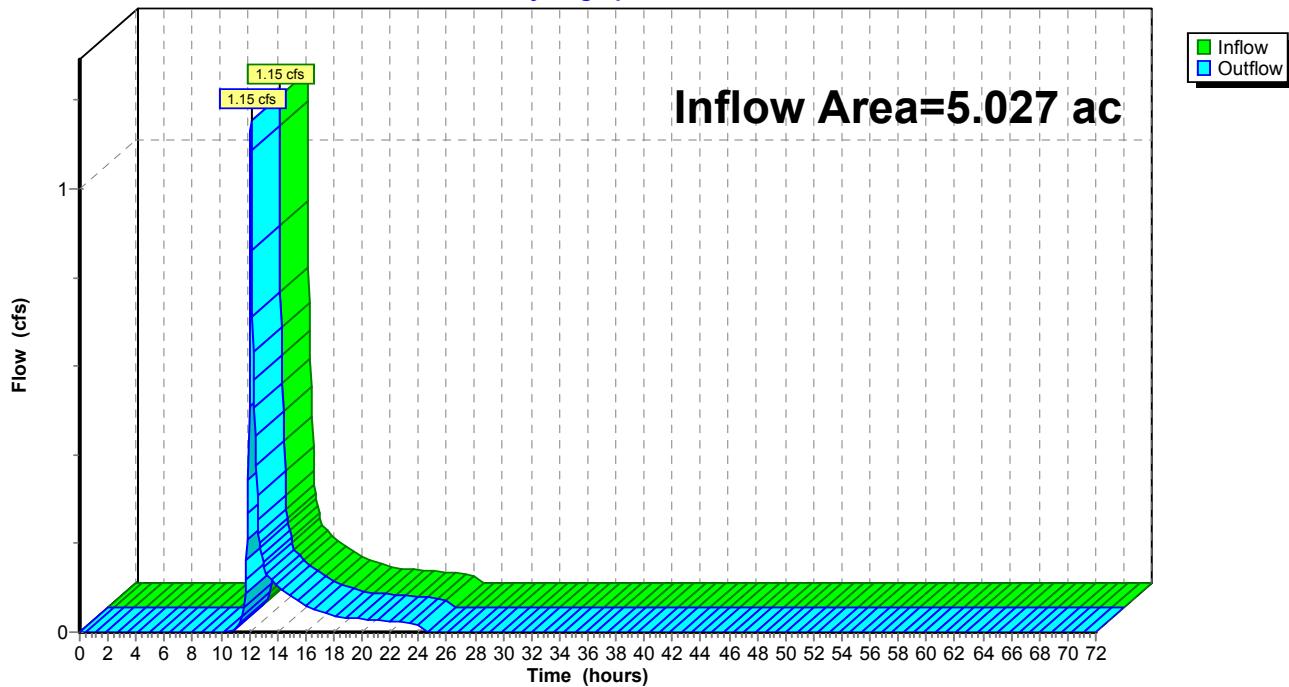
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.027 ac, 50.13% Impervious, Inflow Depth = 0.22" for 2-Year event
 Inflow = 1.15 cfs @ 12.12 hrs, Volume= 0.091 af
 Outflow = 1.15 cfs @ 12.12 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-3: DP-3

Hydrograph



Summary for Reach DP-4: PL

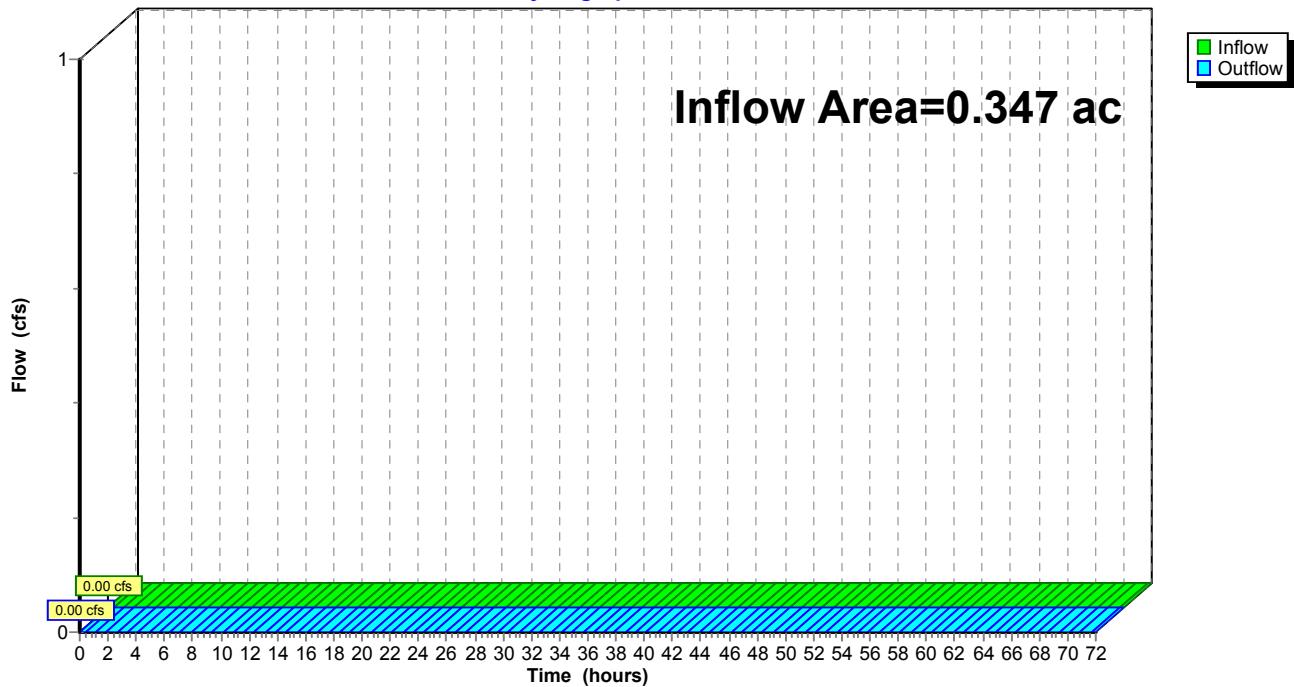
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.347 ac, 31.11% Impervious, Inflow Depth = 0.00" for 2-Year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-4: PL

Hydrograph



Summary for Reach DP-5: PL

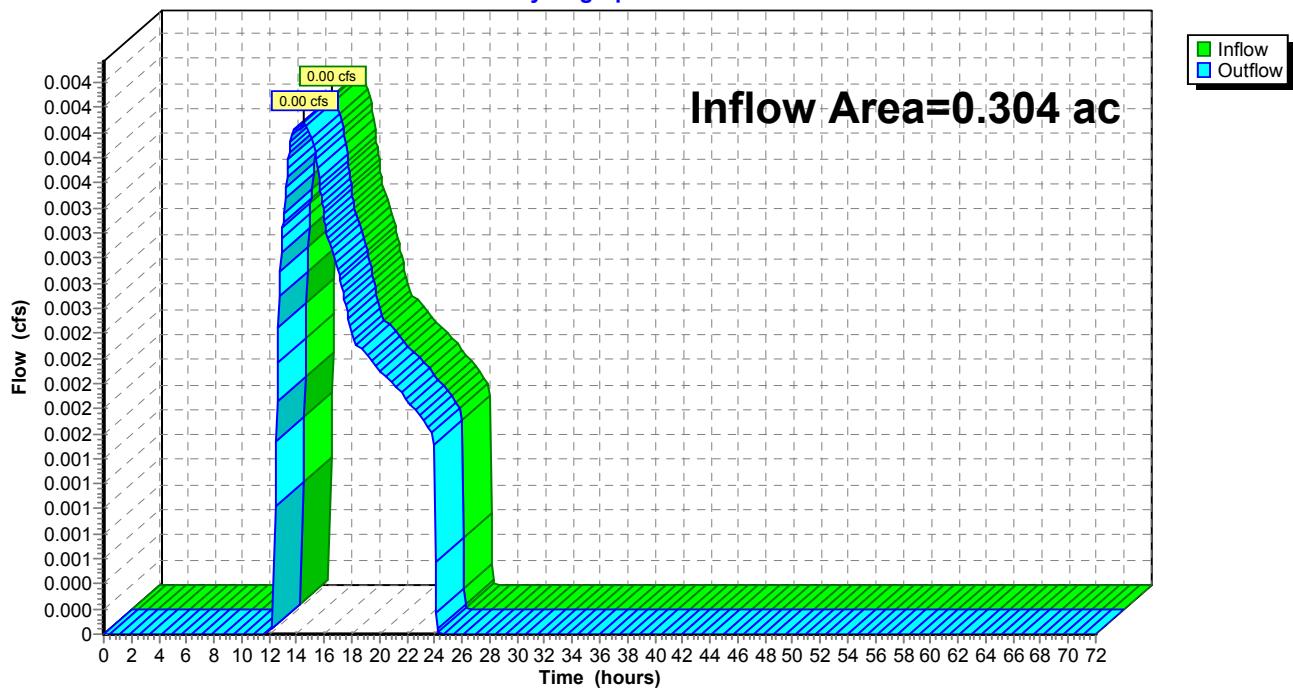
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.304 ac, 9.23% Impervious, Inflow Depth = 0.10" for 2-Year event
 Inflow = 0.00 cfs @ 14.57 hrs, Volume= 0.003 af
 Outflow = 0.00 cfs @ 14.57 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-5: PL

Hydrograph



Summary for Pond D-1: Depression

Inflow Area = 0.197 ac, 7.82% Impervious, Inflow Depth = 0.08" for 2-Year event
 Inflow = 0.00 cfs @ 14.81 hrs, Volume= 0.001 af
 Outflow = 0.00 cfs @ 14.83 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.9 min
 Discarded = 0.00 cfs @ 14.83 hrs, Volume= 0.001 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.00' @ 14.83 hrs Surf.Area= 419 sf Storage= 0 cf

Plug-Flow detention time= 0.9 min calculated for 0.001 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (1,063.1 - 1,062.2)

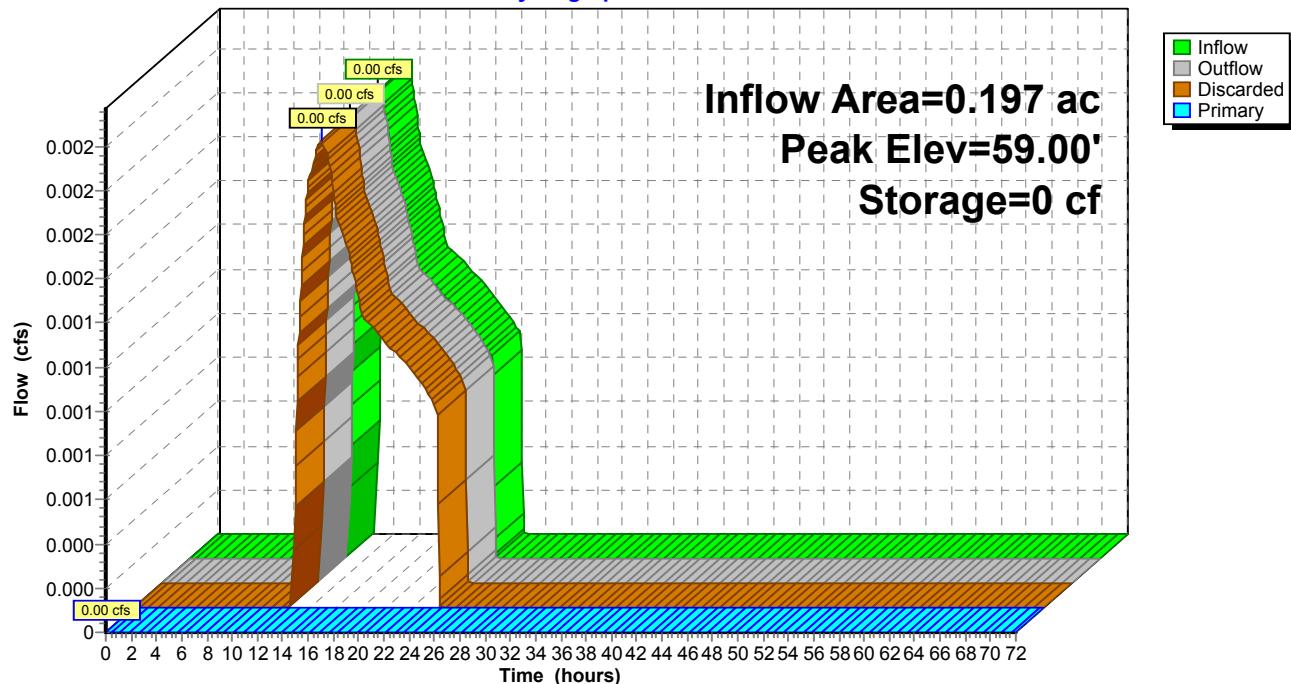
Volume	Invert	Avail.Storage	Storage Description	
#1	59.00'	615 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
59.00	419	0	0	
60.00	811	615	615	
Device	Routing	Invert	Outlet Devices	
#1	Discarded	59.00'	8.270 in/hr Exfiltration over Surface area	Phase-In= 0.01'
#2	Primary	60.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir	
			Head (feet)	0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
				2.50 3.00 3.50 4.00 4.50
			Coef. (English)	2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
				2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.00 cfs @ 14.83 hrs HW=59.00' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' TW=0.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond D-1: Depression

Hydrograph



Summary for Pond D-2: Depression

Inflow Area = 0.371 ac, 20.21% Impervious, Inflow Depth = 0.42" for 2-Year event
 Inflow = 0.09 cfs @ 12.15 hrs, Volume= 0.013 af
 Outflow = 0.09 cfs @ 12.17 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.8 min
 Discarded = 0.09 cfs @ 12.17 hrs, Volume= 0.013 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

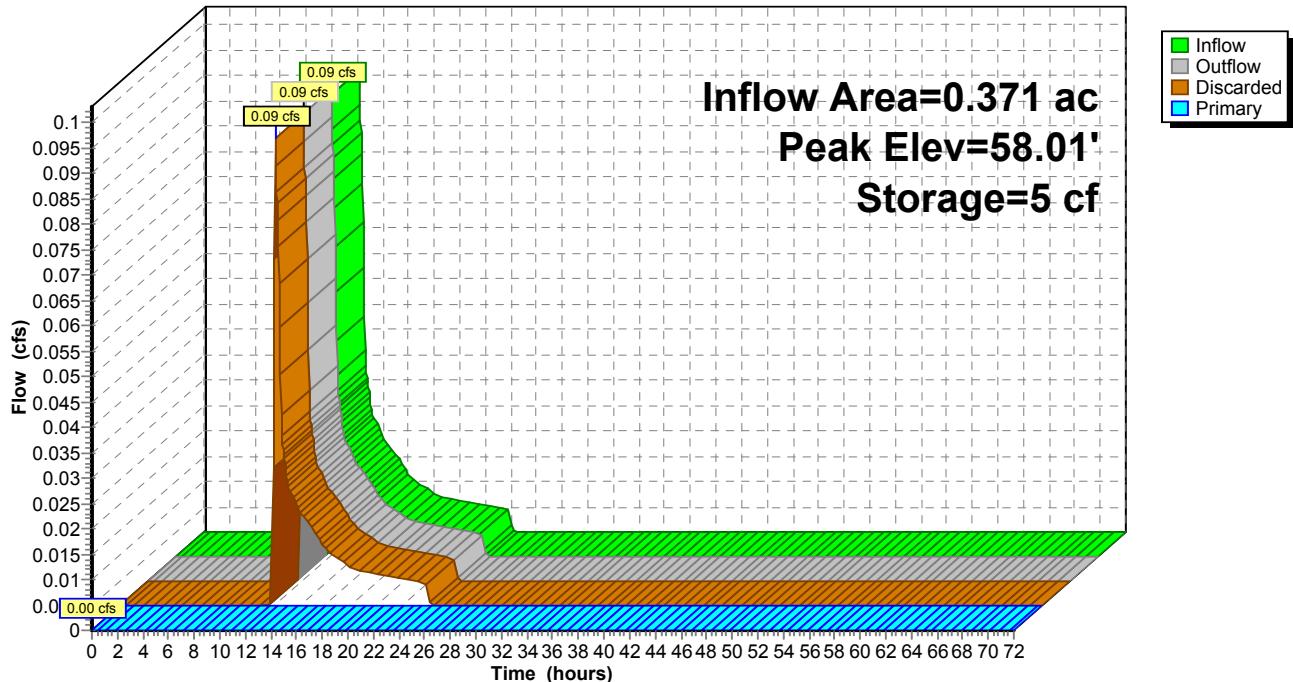
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 58.01' @ 12.17 hrs Surf.Area= 728 sf Storage= 5 cf

Plug-Flow detention time= 0.9 min calculated for 0.013 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (928.0 - 927.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	58.00'	899 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
58.00	726	0	0	
59.00	1,071	899	899	
Device	Routing	Invert	Outlet Devices	
#1	Discarded	58.00'	8.270 in/hr Exfiltration over Surface area	Phase-In= 0.01'
#2	Primary	59.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir	
			Head (feet)	0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
				2.50 3.00 3.50 4.00 4.50
			Coef. (English)	2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
				2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.09 cfs @ 12.17 hrs HW=58.01' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' TW=56.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond D-2: Depression**Hydrograph**

Summary for Pond D-3: Depression

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=82)

Inflow Area = 0.270 ac, 37.46% Impervious, Inflow Depth = 0.62" for 2-Year event
 Inflow = 0.14 cfs @ 12.12 hrs, Volume= 0.014 af
 Outflow = 0.03 cfs @ 12.10 hrs, Volume= 0.014 af, Atten= 79%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 12.10 hrs, Volume= 0.014 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 63.16' @ 12.83 hrs Surf.Area= 854 sf Storage= 129 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 30.7 min (931.6 - 900.9)

Volume	Invert	Avail.Storage	Storage Description	
#1	63.00'	2,747 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
63.00	757	0	0	
64.00	1,368	1,063	1,063	
65.00	2,001	1,685	2,747	

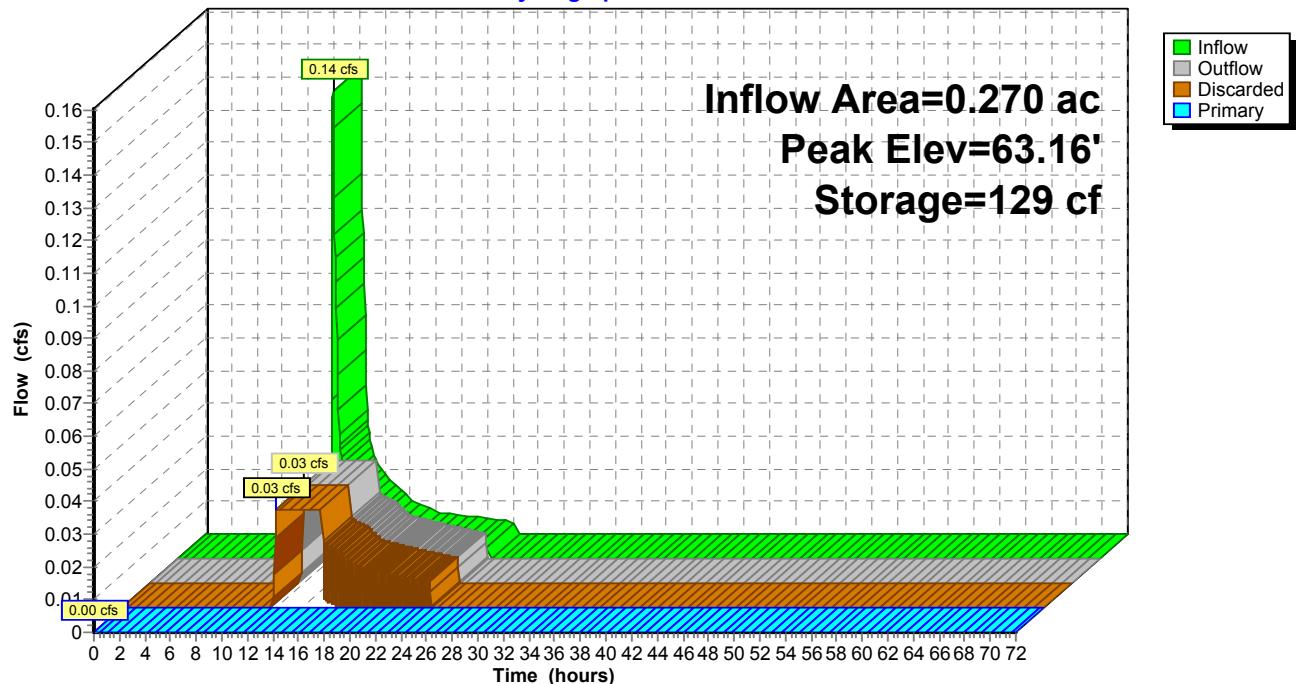
Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	0.03 cfs Exfiltration when above 63.00'
#2	Primary	65.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.03 cfs @ 12.10 hrs HW=63.03' (Free Discharge)

↑ 1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=63.00' TW=0.00' (Dynamic Tailwater)

↑ 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond D-3: Depression**Hydrograph**

Summary for Pond D-4: Depression

Inflow Area = 0.078 ac, 9.16% Impervious, Inflow Depth = 0.08" for 2-Year event
 Inflow = 0.00 cfs @ 14.81 hrs, Volume= 0.001 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.04' @ 24.40 hrs Surf.Area= 645 sf Storage= 23 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

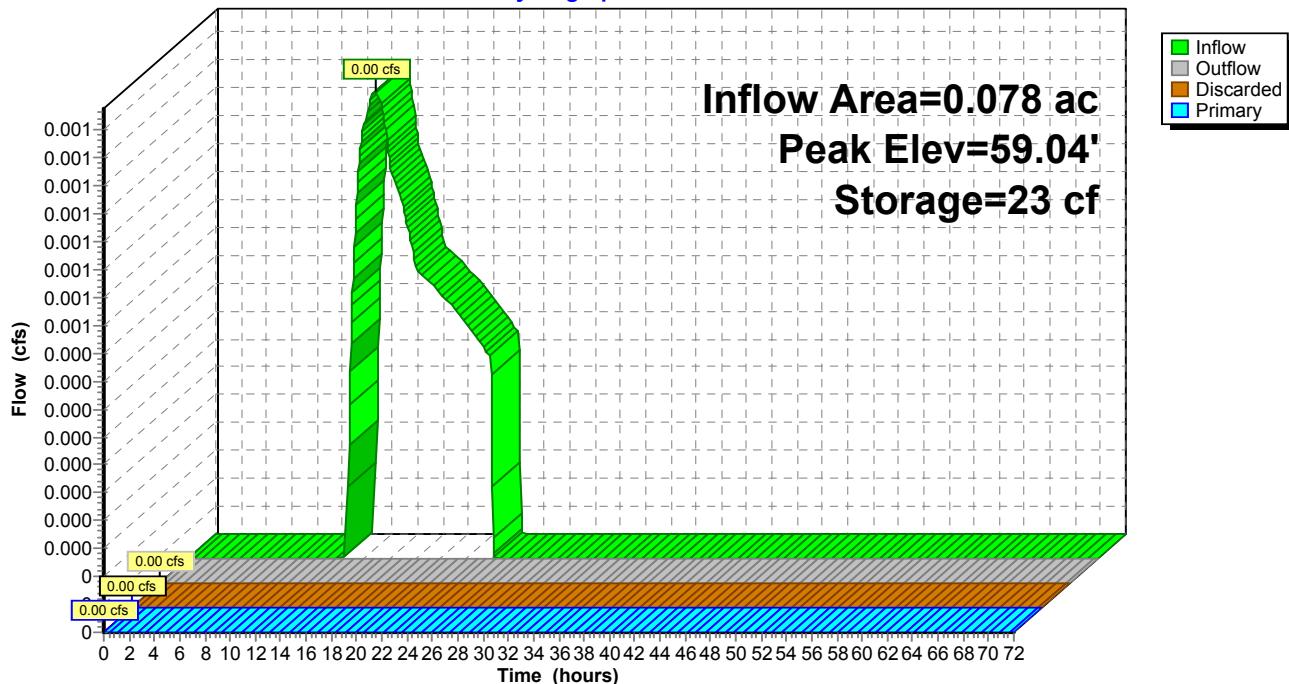
Volume	Invert	Avail.Storage	Storage Description	
#1	59.00'	938 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	622	0	0
60.00	1,254	938	938

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	0.03 cfs Exfiltration when above 63.00'
#2	Primary	65.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond D-4: Depression**Hydrograph**

Summary for Pond DB-1: Prop Detention Basin

Inflow Area = 3.691 ac, 55.72% Impervious, Inflow Depth = 1.25" for 2-Year event
 Inflow = 5.10 cfs @ 12.10 hrs, Volume= 0.384 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.16' @ 24.40 hrs Surf.Area= 9,761 sf Storage= 16,714 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	25,568 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	5,474	0	0
59.00	7,714	6,594	6,594
60.00	9,473	8,594	15,188
61.00	11,288	10,381	25,568

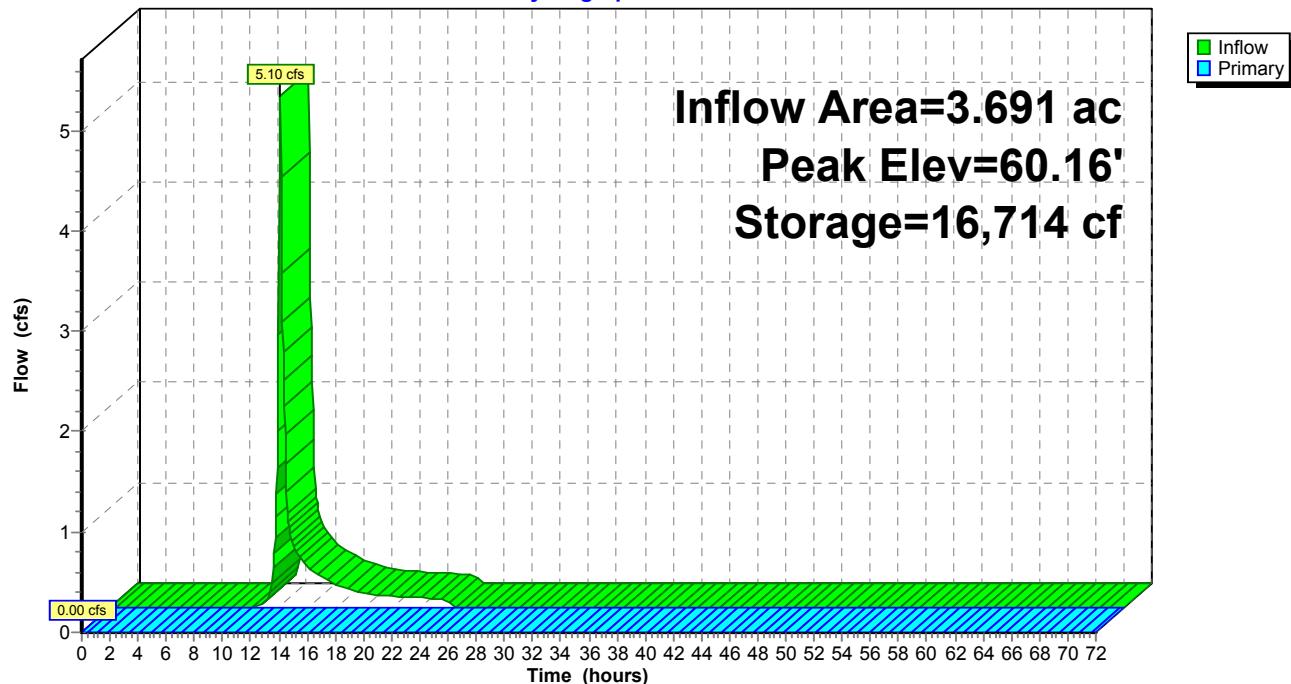
Device	Routing	Invert	Outlet Devices
#1	Primary	58.20'	10.0" Round Culvert L= 25.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 58.20' / 58.05' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 0.55 sf
#2	Device 1	60.20'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.6' Crest Height
#3	Device 1	61.50'	7.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s) 2.4' Crest Height

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' TW=56.00' (Dynamic Tailwater)

↑ 1=Culvert (Controls 0.00 cfs)

 └─ 2=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

 └─ 3=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond DB-1: Prop Detention Basin**Hydrograph**

Summary for Pond P1: Infiltration Chambers

Inflow Area = 0.044 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af
 Outflow = 0.04 cfs @ 11.85 hrs, Volume= 0.012 af, Atten= 75%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.85 hrs, Volume= 0.012 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.11' @ 12.45 hrs Surf.Area= 199 sf Storage= 102 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 12.3 min (766.3 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	195 cf	6.33'W x 31.50'L x 3.54'H Field A 707 cf Overall - 220 cf Embedded = 487 cf x 40.0% Voids
#2A	56.70'	220 cf	Cultec R-330XLHD x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.200 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.85 hrs HW=56.26' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P1: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

4 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 29.50' Row Length +12.0" End Stone x 2 = 31.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

4 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 219.8 cf Chamber Storage

706.6 cf Field - 219.8 cf Chambers = 486.8 cf Stone x 40.0% Voids = 194.7 cf Stone Storage

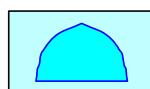
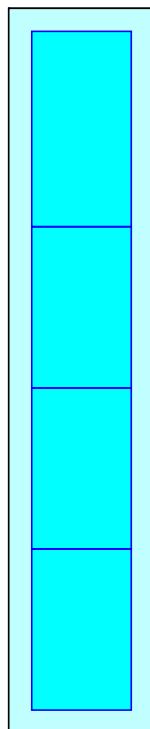
Chamber Storage + Stone Storage = 414.5 cf = 0.010 af

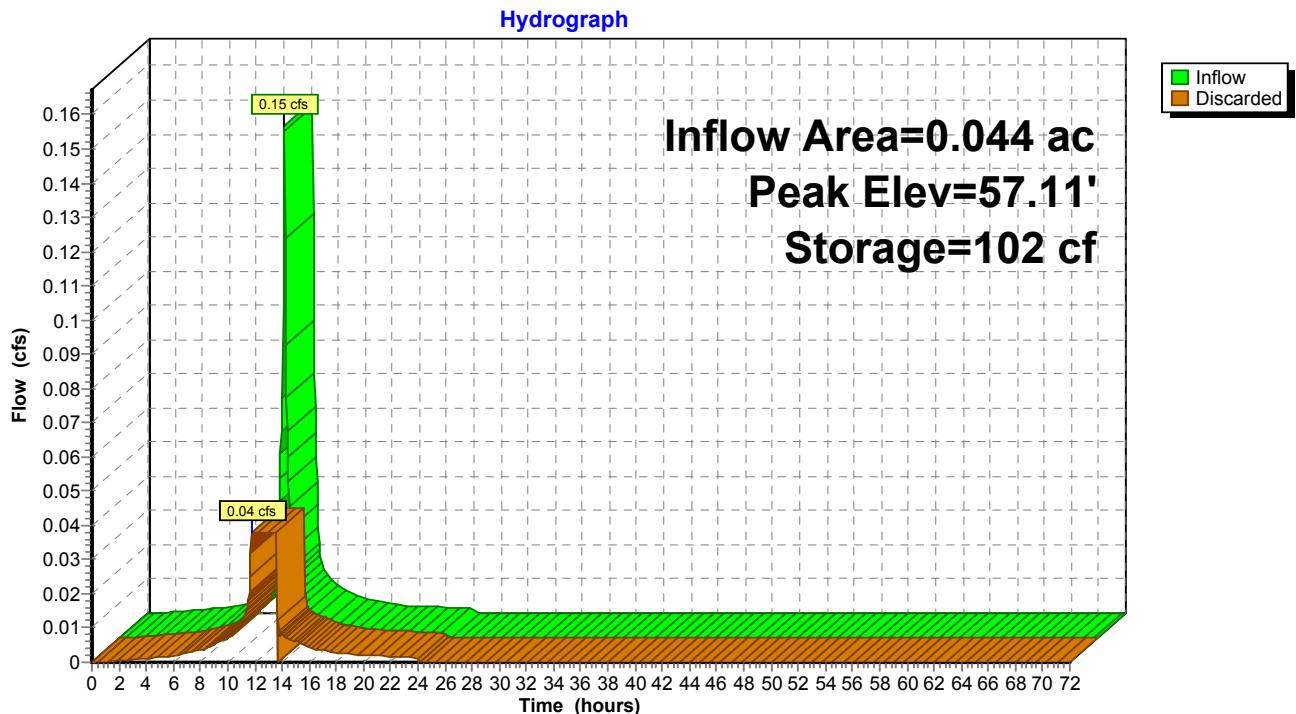
Overall Storage Efficiency = 58.7%

4 Chambers

26.2 cy Field

18.0 cy Stone



Pond P1: Infiltration Chambers

Summary for Pond P10: Infiltration Chambers

Inflow Area = 0.044 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.15 cfs @ 12.09 hrs, Volume= 0.012 af
 Outflow = 0.04 cfs @ 11.85 hrs, Volume= 0.012 af, Atten= 74%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.85 hrs, Volume= 0.012 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.51' @ 12.45 hrs Surf.Area= 199 sf Storage= 101 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 12.1 min (766.1 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	195 cf	6.33'W x 31.50'L x 3.54'H Field A 707 cf Overall - 220 cf Embedded = 487 cf x 40.0% Voids
#2A	60.10'	220 cf	Cultec R-330XLHD x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.85 hrs HW=59.66' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P10: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

4 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 29.50' Row Length +12.0" End Stone x 2 = 31.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

4 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 219.8 cf Chamber Storage

706.6 cf Field - 219.8 cf Chambers = 486.8 cf Stone x 40.0% Voids = 194.7 cf Stone Storage

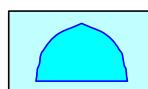
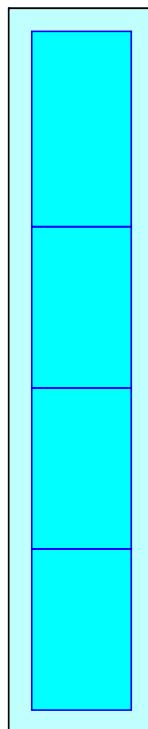
Chamber Storage + Stone Storage = 414.5 cf = 0.010 af

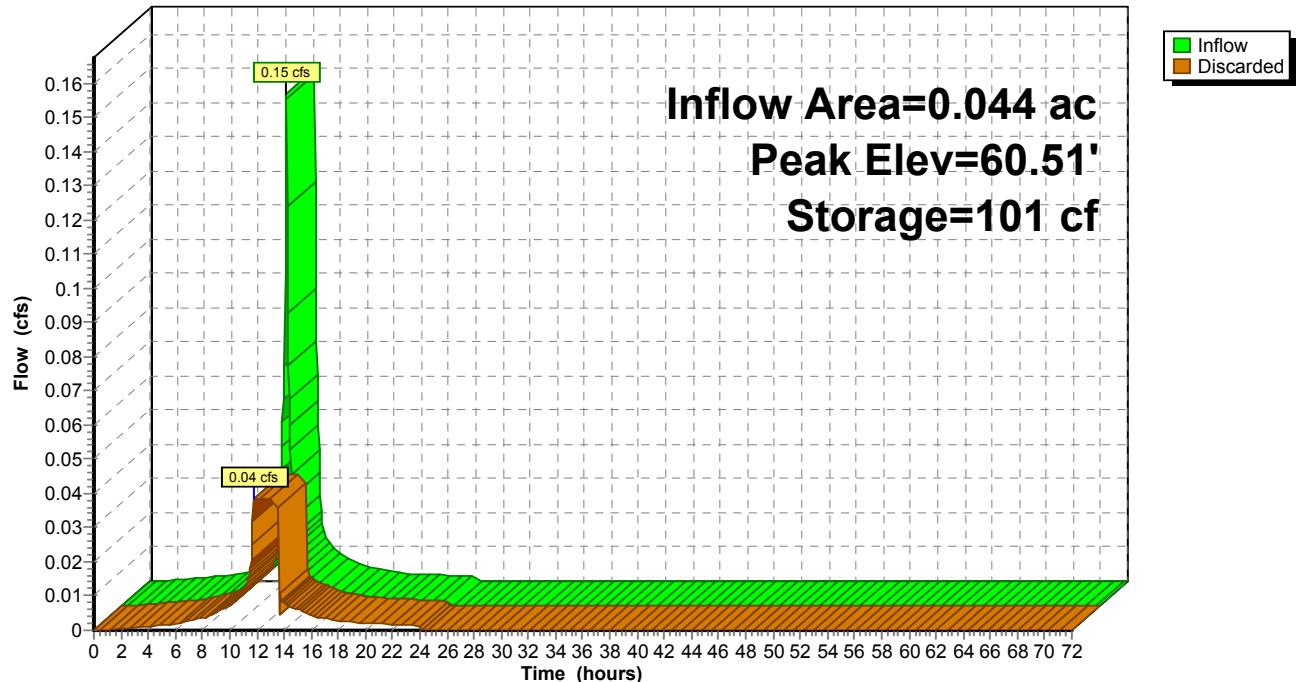
Overall Storage Efficiency = 58.7%

4 Chambers

26.2 cy Field

18.0 cy Stone



Pond P10: Infiltration Chambers**Hydrograph**

Summary for Pond P11: Infiltration Chambers

Inflow Area = 0.087 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.025 af
 Outflow = 0.06 cfs @ 11.80 hrs, Volume= 0.025 af, Atten= 79%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.80 hrs, Volume= 0.025 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 64.18' @ 12.50 hrs Surf.Area= 332 sf Storage= 236 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 18.1 min (772.1 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	63.00'	321 cf	6.33'W x 52.50'L x 3.54'H Field A 1,178 cf Overall - 376 cf Embedded = 801 cf x 40.0% Voids
#2A	63.50'	376 cf	Cultec R-330XLHD x 7 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
697 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.06 cfs @ 11.80 hrs HW=63.06' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.06 cfs)

Pond P11: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

7 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 50.50' Row Length +12.0" End Stone x 2 = 52.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

7 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 376.3 cf Chamber Storage

1,177.6 cf Field - 376.3 cf Chambers = 801.3 cf Stone x 40.0% Voids = 320.5 cf Stone Storage

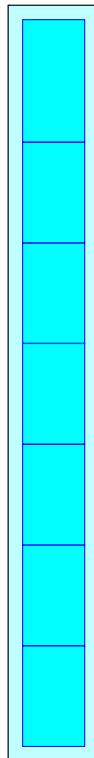
Chamber Storage + Stone Storage = 696.8 cf = 0.016 af

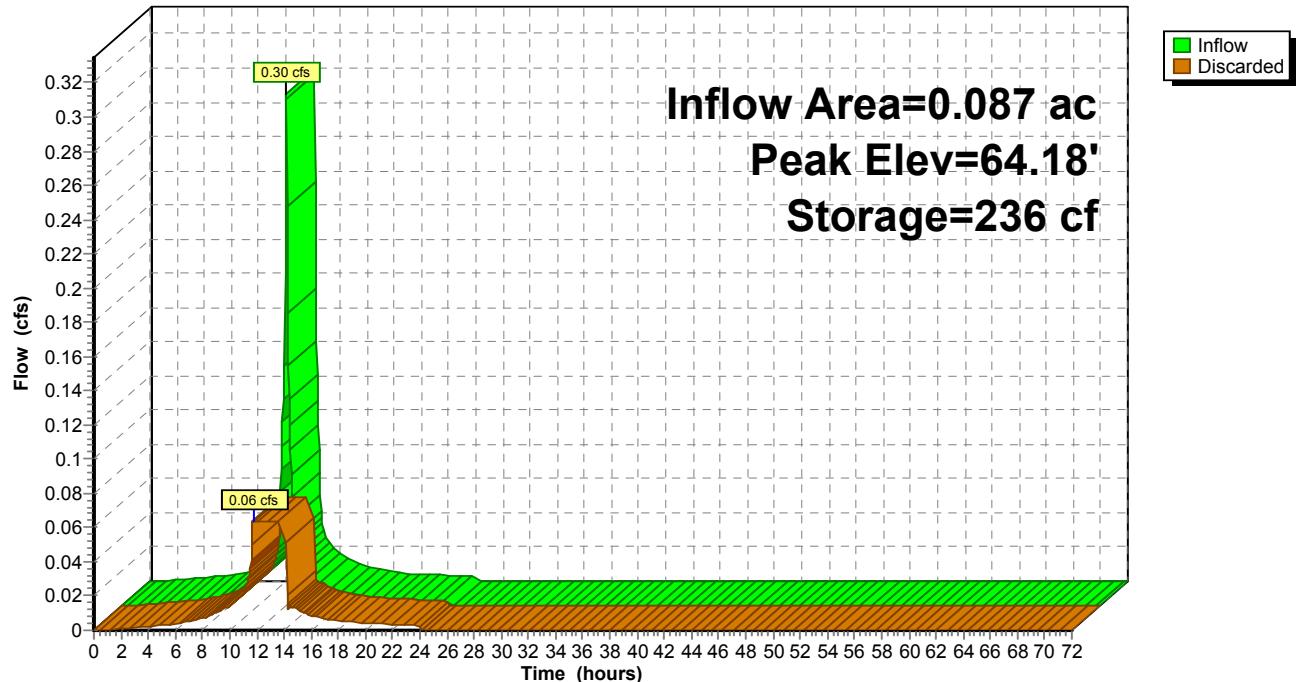
Overall Storage Efficiency = 59.2%

7 Chambers

43.6 cy Field

29.7 cy Stone



Pond P11: Infiltration Chambers**Hydrograph**

Summary for Pond P12: Infiltration Chambers

Inflow Area = 0.168 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.58 cfs @ 12.09 hrs, Volume= 0.047 af
 Outflow = 0.19 cfs @ 11.90 hrs, Volume= 0.047 af, Atten= 67%, Lag= 0.0 min
 Discarded = 0.19 cfs @ 11.90 hrs, Volume= 0.047 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 56.83' @ 12.38 hrs Surf.Area= 977 sf Storage= 297 cf

Plug-Flow detention time= 6.8 min calculated for 0.047 af (100% of inflow)
 Center-of-Mass det. time= 6.8 min (760.8 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	875 cf	11.17'W x 87.50'L x 3.54'H Field A 3,461 cf Overall - 1,274 cf Embedded = 2,186 cf x 40.0% Voids
#2A	56.70'	1,274 cf	Cultec R-330XLHD x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
2,149 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.19 cfs @ 11.90 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.19 cfs)

Pond P12: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

12 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 85.50' Row Length +12.0" End Stone x 2 = 87.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

24 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,274.1 cf Chamber Storage

3,460.5 cf Field - 1,274.1 cf Chambers = 2,186.4 cf Stone x 40.0% Voids = 874.6 cf Stone Storage

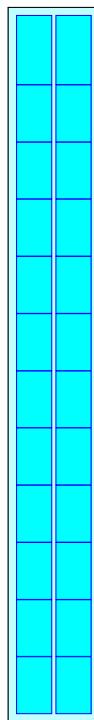
Chamber Storage + Stone Storage = 2,148.7 cf = 0.049 af

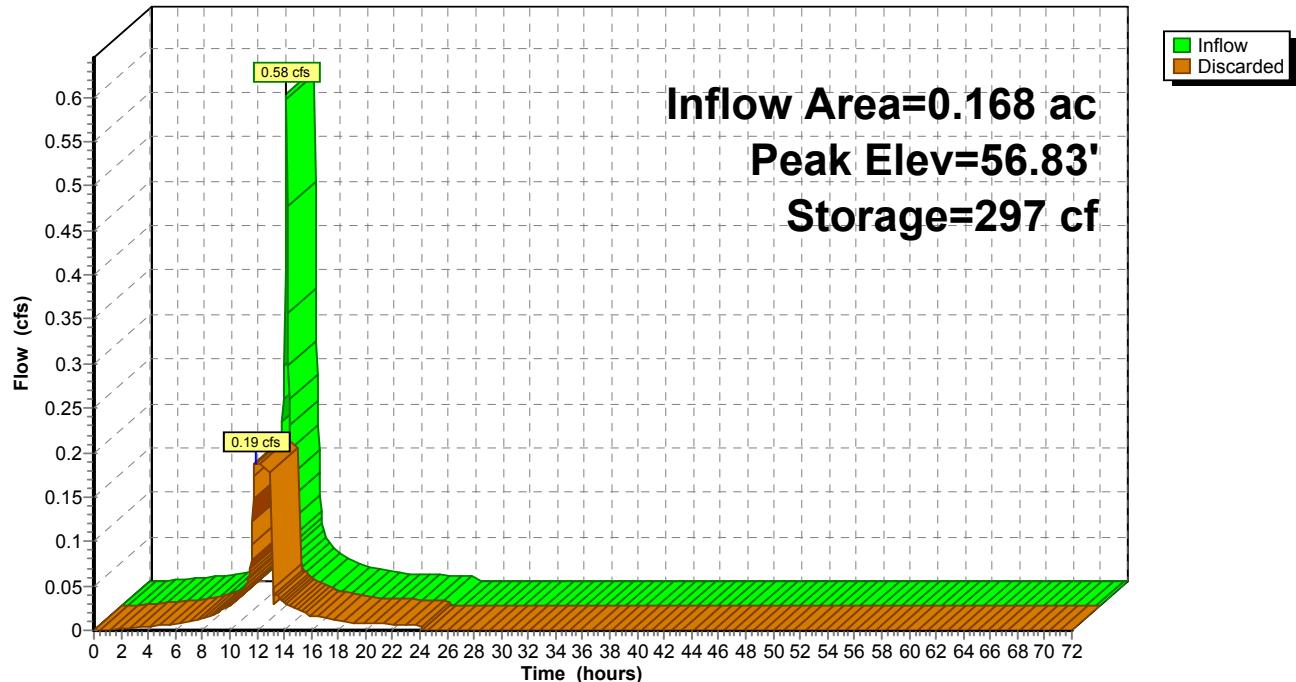
Overall Storage Efficiency = 62.1%

24 Chambers

128.2 cy Field

81.0 cy Stone



Pond P12: Infiltration Chambers**Hydrograph**

Summary for Pond P13: Infiltration Chambers

Inflow Area = 0.138 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.47 cfs @ 12.09 hrs, Volume= 0.039 af
 Outflow = 0.19 cfs @ 12.00 hrs, Volume= 0.039 af, Atten= 60%, Lag= 0.0 min
 Discarded = 0.19 cfs @ 12.00 hrs, Volume= 0.039 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 56.67' @ 12.31 hrs Surf.Area= 977 sf Storage= 185 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 4.1 min (758.1 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	875 cf	11.17'W x 87.50'L x 3.54'H Field A 3,461 cf Overall - 1,274 cf Embedded = 2,186 cf x 40.0% Voids
#2A	56.70'	1,274 cf	Cultec R-330XLHD x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
2,149 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.19 cfs @ 12.00 hrs HW=56.26' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.19 cfs)

Pond P13: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

12 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 85.50' Row Length +12.0" End Stone x 2 = 87.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

24 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,274.1 cf Chamber Storage

3,460.5 cf Field - 1,274.1 cf Chambers = 2,186.4 cf Stone x 40.0% Voids = 874.6 cf Stone Storage

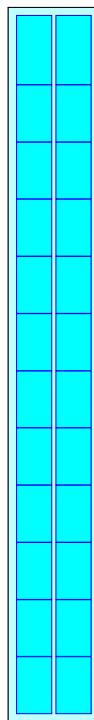
Chamber Storage + Stone Storage = 2,148.7 cf = 0.049 af

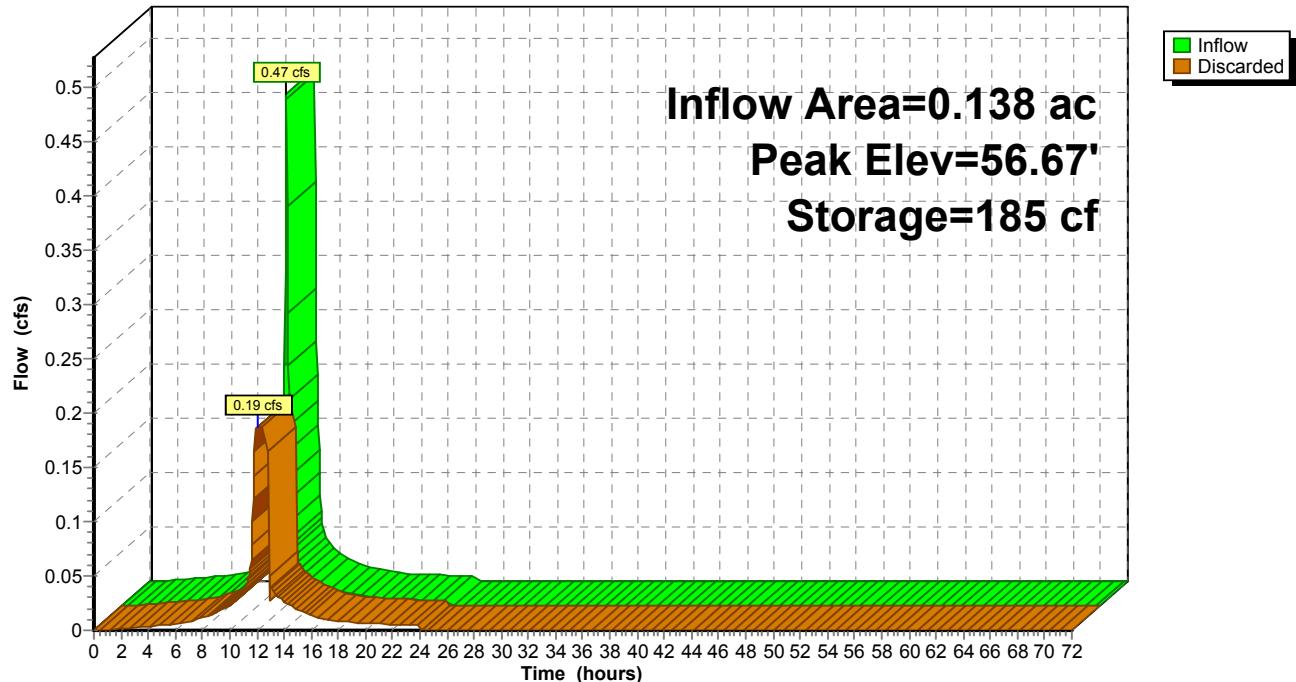
Overall Storage Efficiency = 62.1%

24 Chambers

128.2 cy Field

81.0 cy Stone



Pond P13: Infiltration Chambers**Hydrograph**

Summary for Pond P14: Infiltration Chambers

Inflow Area = 0.173 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.59 cfs @ 12.09 hrs, Volume= 0.049 af
 Outflow = 0.13 cfs @ 11.80 hrs, Volume= 0.049 af, Atten= 79%, Lag= 0.0 min
 Discarded = 0.13 cfs @ 11.80 hrs, Volume= 0.049 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.62' @ 12.50 hrs Surf.Area= 664 sf Storage= 464 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 17.8 min (771.8 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	58.50'	599 cf	11.17'W x 59.50'L x 3.54'H Field A 2,353 cf Overall - 857 cf Embedded = 1,496 cf x 40.0% Voids
#2A	59.00'	857 cf	Cultec R-330XLHD x 16 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
1,455 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	58.50'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.13 cfs @ 11.80 hrs HW=58.56' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.13 cfs)

Pond P14: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

8 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 57.50' Row Length +12.0" End Stone x 2 = 59.50'
Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

16 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 856.9 cf Chamber Storage

2,353.1 cf Field - 856.9 cf Chambers = 1,496.3 cf Stone x 40.0% Voids = 598.5 cf Stone Storage

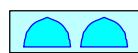
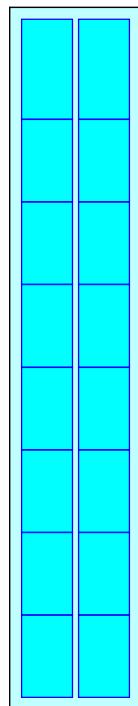
Chamber Storage + Stone Storage = 1,455.4 cf = 0.033 af

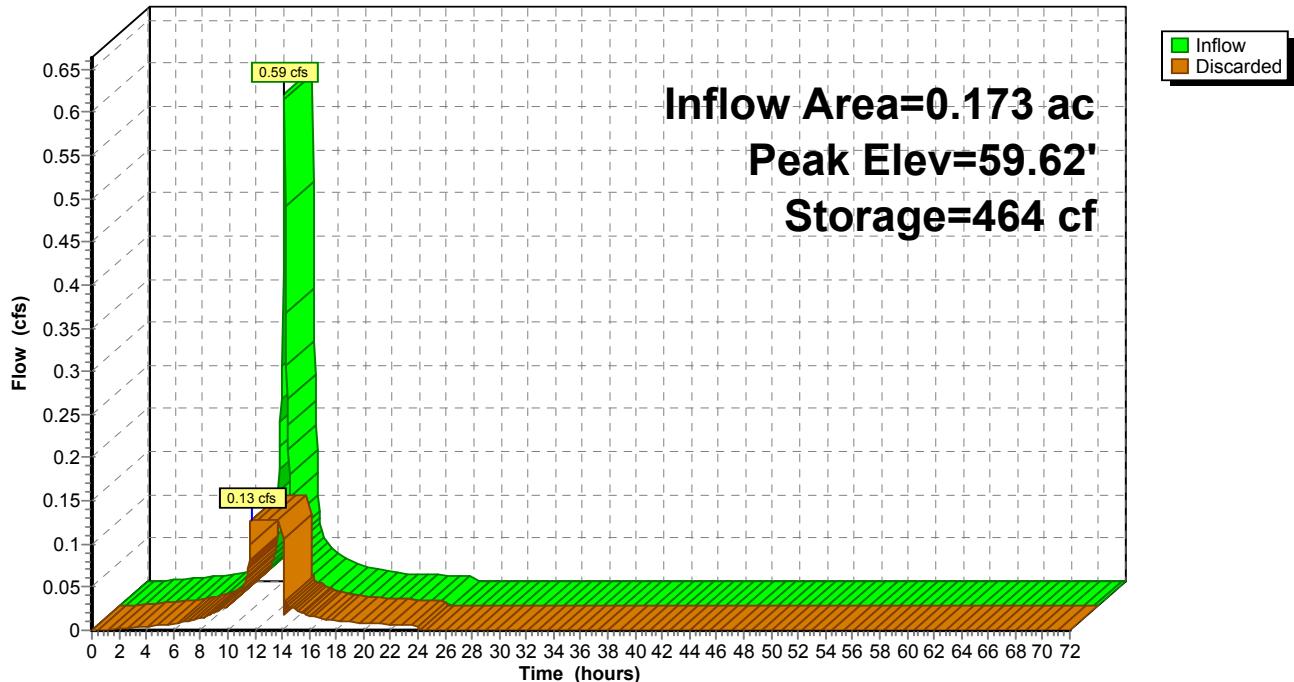
Overall Storage Efficiency = 61.8%

16 Chambers

87.2 cy Field

55.4 cy Stone



Pond P14: Infiltration Chambers**Hydrograph**

Summary for Pond P15: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af, Atten= 74%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.51' @ 12.45 hrs Surf.Area= 111 sf Storage= 55 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 11.8 min (765.8 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.85 hrs HW=59.66' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P15: Infiltration Chambers - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

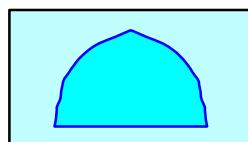
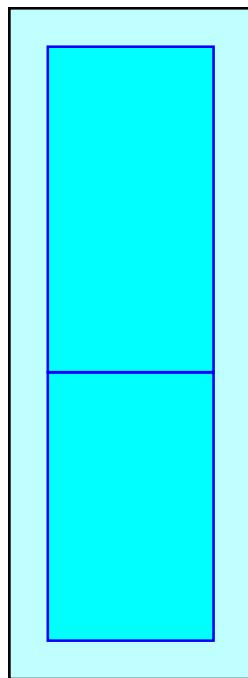
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

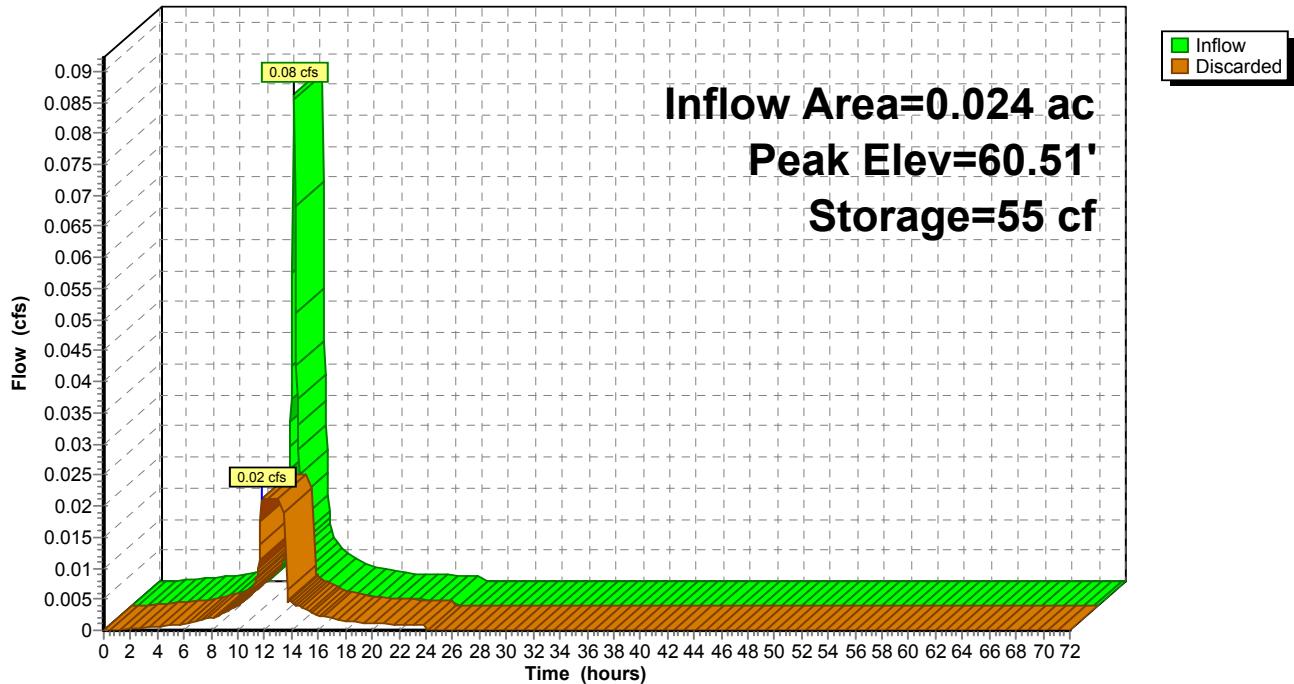
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P15: Infiltration Chambers**Hydrograph**

Summary for Pond P16: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af, Atten= 74%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.52' @ 12.45 hrs Surf.Area= 111 sf Storage= 56 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 12.1 min (766.0 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.85 hrs HW=59.66' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P16: Infiltration Chambers - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

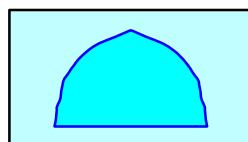
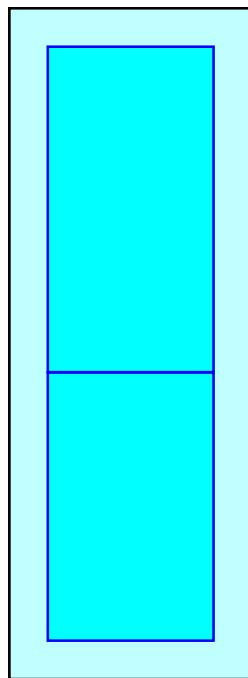
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

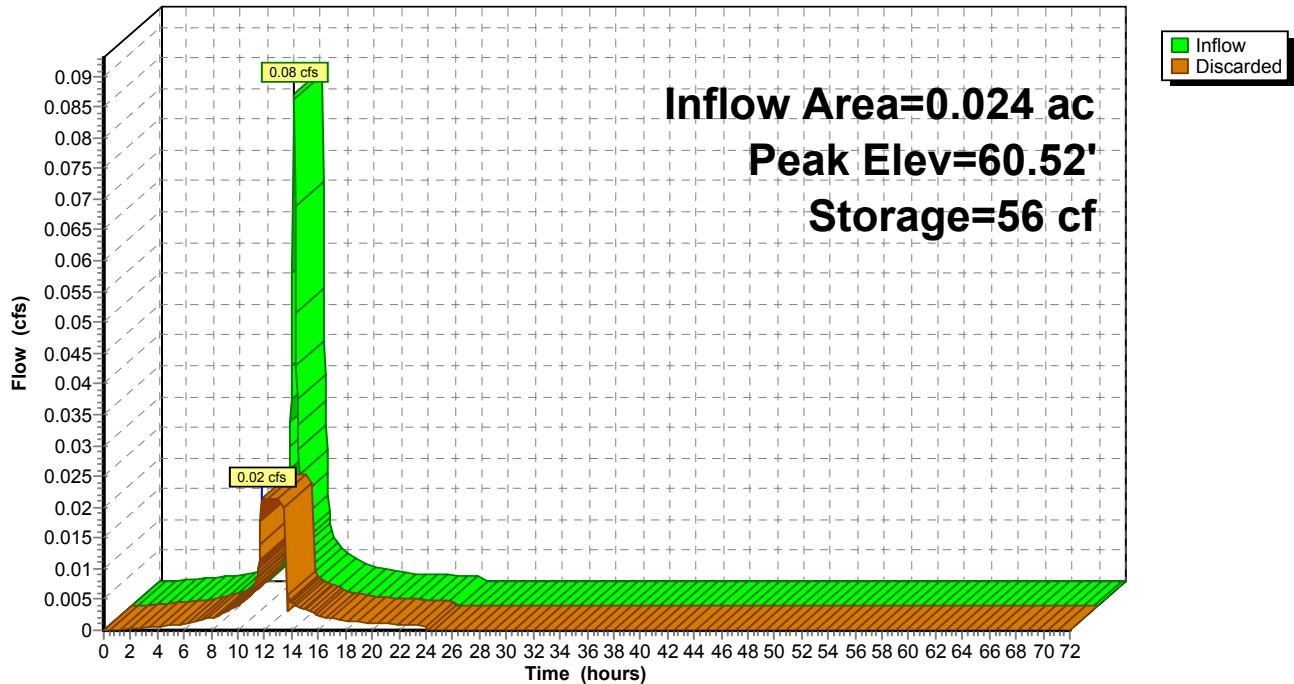
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P16: Infiltration Chambers**Hydrograph**

Summary for Pond P17: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af, Atten= 74%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.50' @ 12.45 hrs Surf.Area= 111 sf Storage= 54 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 11.7 min (765.7 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.85 hrs HW=59.66' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P17: Infiltration Chambers - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

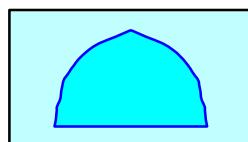
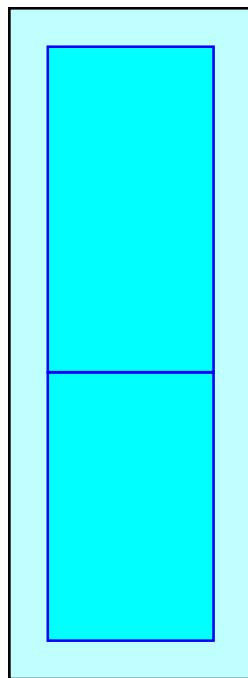
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

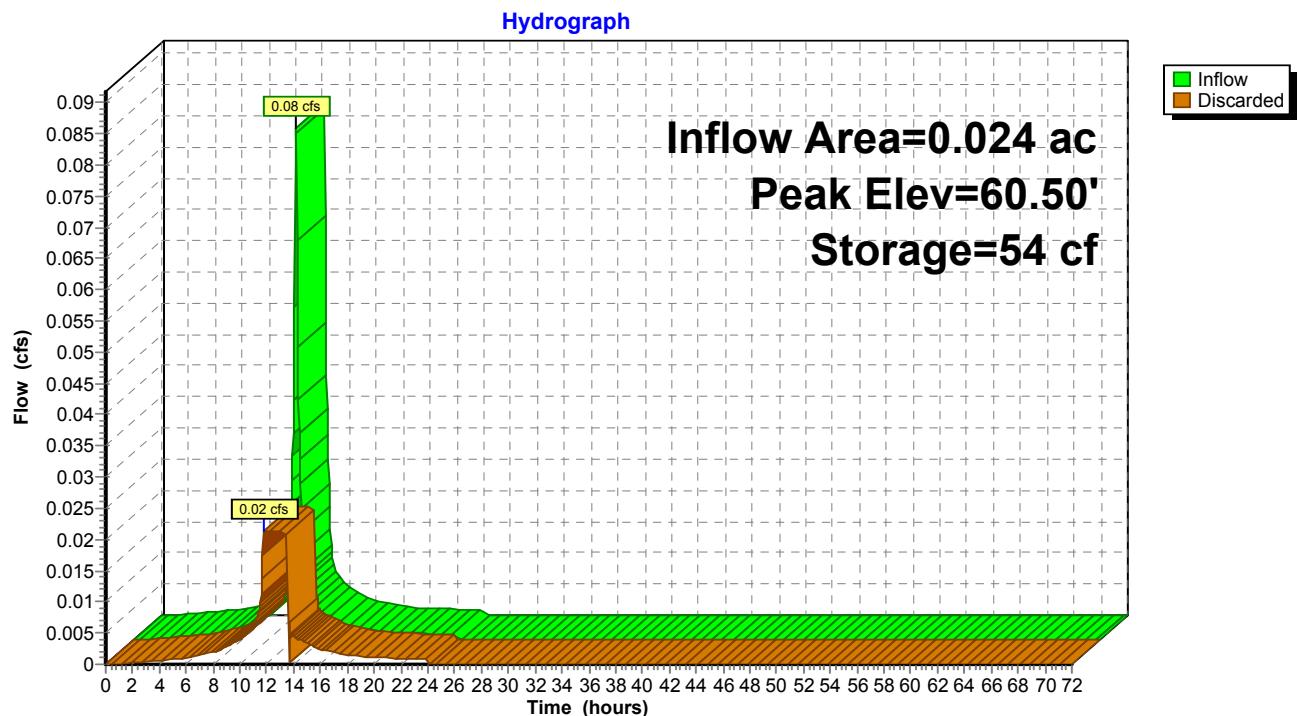
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P17: Infiltration Chambers

Summary for Pond P18: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af, Atten= 74%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.50' @ 12.45 hrs Surf.Area= 111 sf Storage= 54 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 11.6 min (765.6 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.85 hrs HW=59.66' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P18: Infiltration Chambers - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

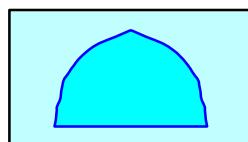
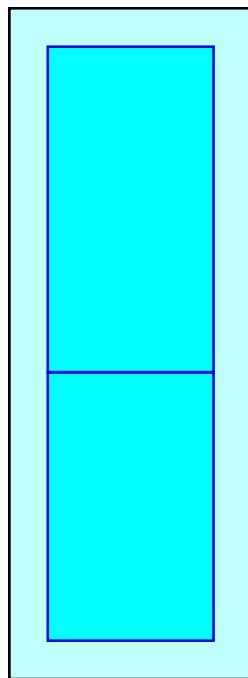
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

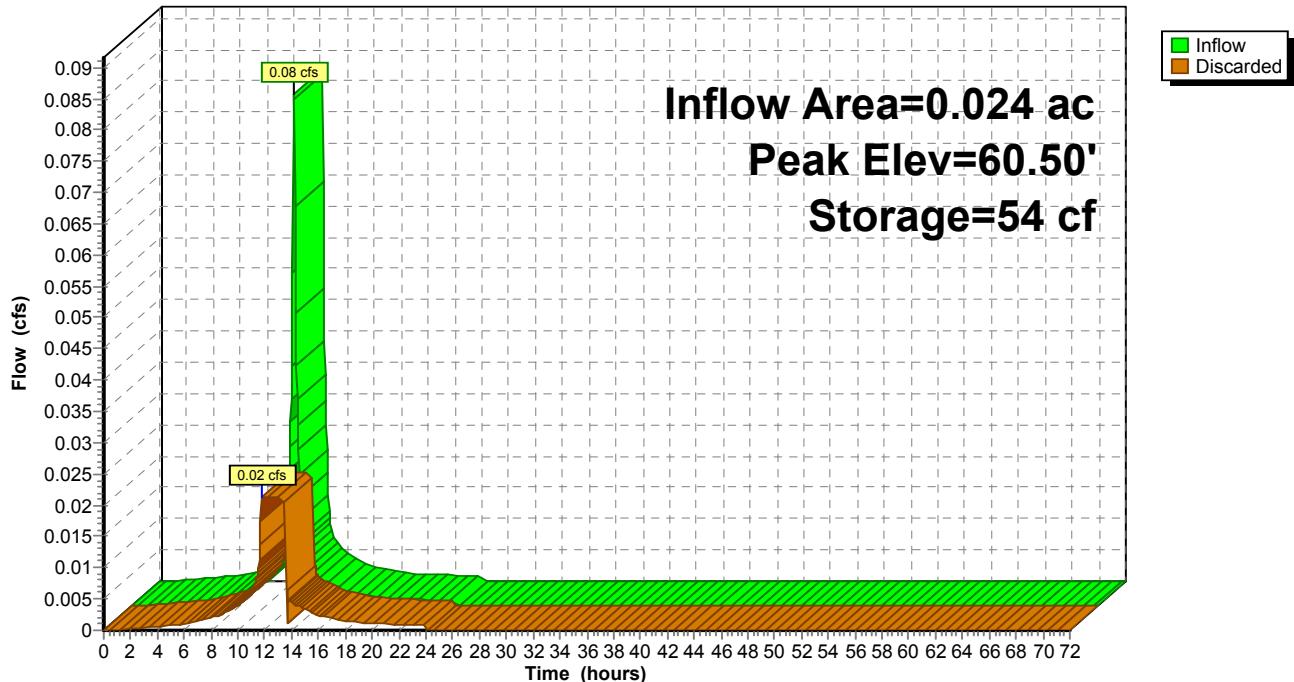
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P18: Infiltration Chambers**Hydrograph**

Summary for Pond P2: Infiltration Chambers

Inflow Area = 0.349 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 1.20 cfs @ 12.09 hrs, Volume= 0.098 af
 Outflow = 0.27 cfs @ 11.80 hrs, Volume= 0.098 af, Atten= 78%, Lag= 0.0 min
 Discarded = 0.27 cfs @ 11.80 hrs, Volume= 0.098 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.25' @ 12.49 hrs Surf.Area= 1,385 sf Storage= 912 cf

Plug-Flow detention time= 16.6 min calculated for 0.098 af (100% of inflow)
 Center-of-Mass det. time= 16.6 min (770.6 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	1,194 cf	20.83'W x 66.50'L x 3.54'H Field A 4,907 cf Overall - 1,922 cf Embedded = 2,984 cf x 40.0% Voids
#2A	56.70'	1,922 cf	Cultec R-330XLHD x 36 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
3,116 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.27 cfs @ 11.80 hrs HW=56.26' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.27 cfs)

Pond P2: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

9 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 64.50' Row Length +12.0" End Stone x 2 = 66.50'
Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

36 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 1,922.4 cf Chamber Storage

4,906.7 cf Field - 1,922.4 cf Chambers = 2,984.3 cf Stone x 40.0% Voids = 1,193.7 cf Stone Storage

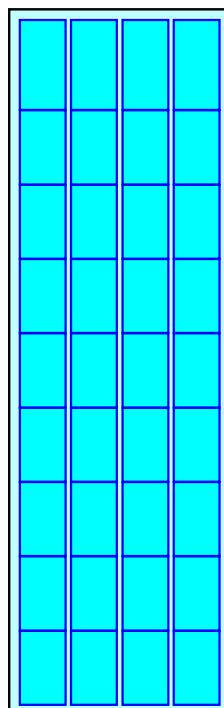
Chamber Storage + Stone Storage = 3,116.1 cf = 0.072 af

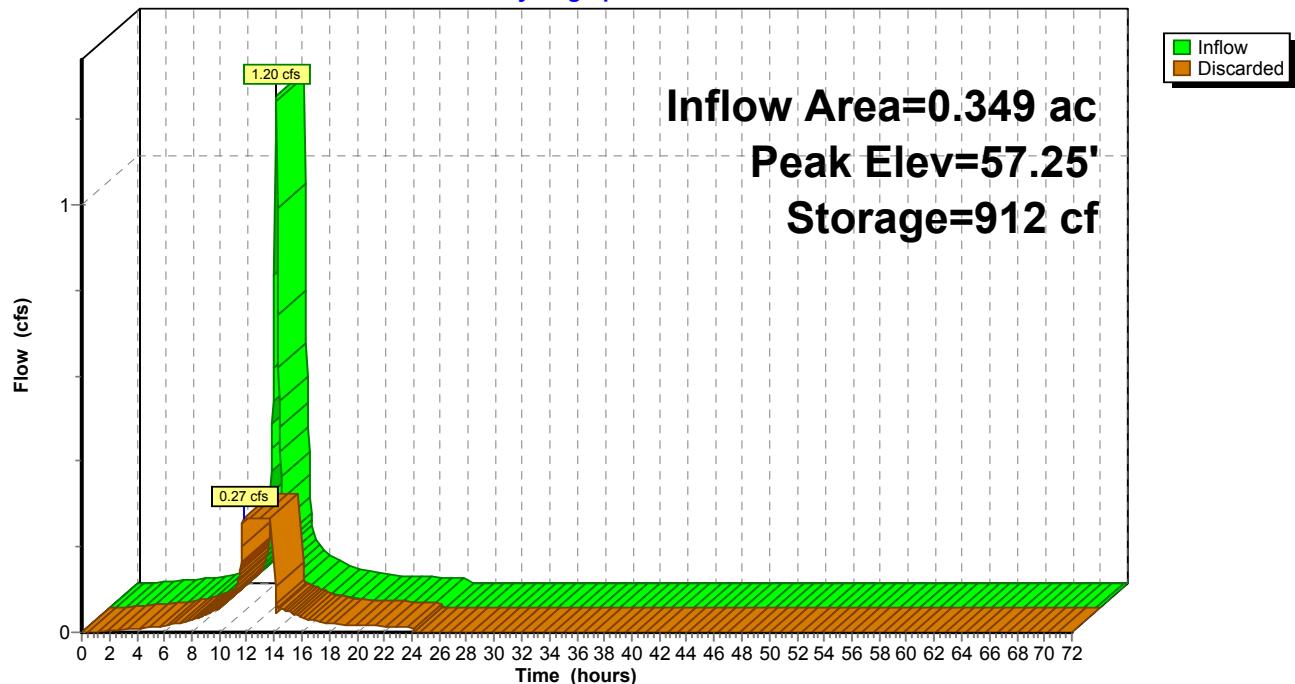
Overall Storage Efficiency = 63.5%

36 Chambers

181.7 cy Field

110.5 cy Stone



Pond P2: Infiltration Chambers**Hydrograph**

Summary for Pond P3: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af, Atten= 74%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.11' @ 12.45 hrs Surf.Area= 111 sf Storage= 55 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 11.8 min (765.8 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	56.70'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.85 hrs HW=56.26' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P3: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

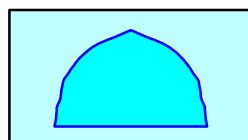
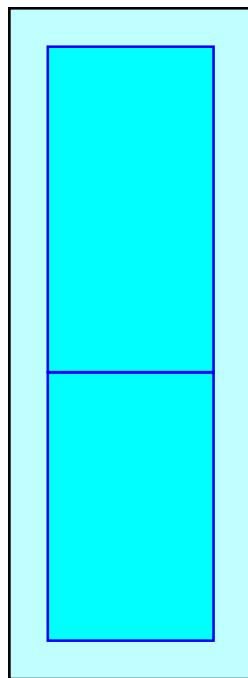
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

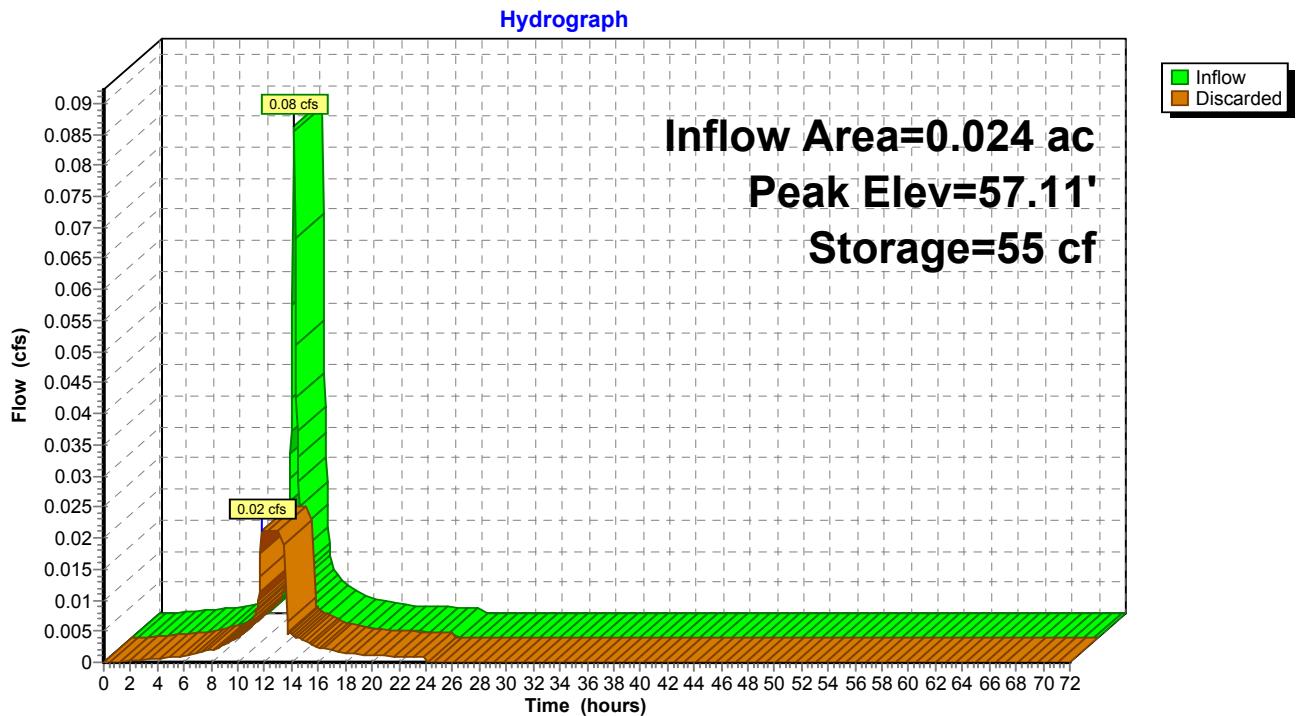
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P3: Infiltration Chambers

Summary for Pond P4: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af, Atten= 74%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.10' @ 12.45 hrs Surf.Area= 111 sf Storage= 55 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 11.8 min (765.7 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	56.70'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.85 hrs HW=56.26' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P4: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

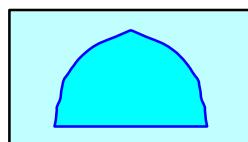
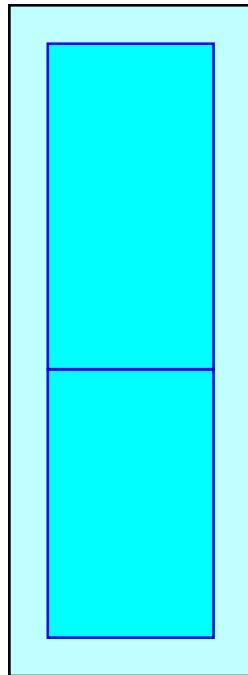
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

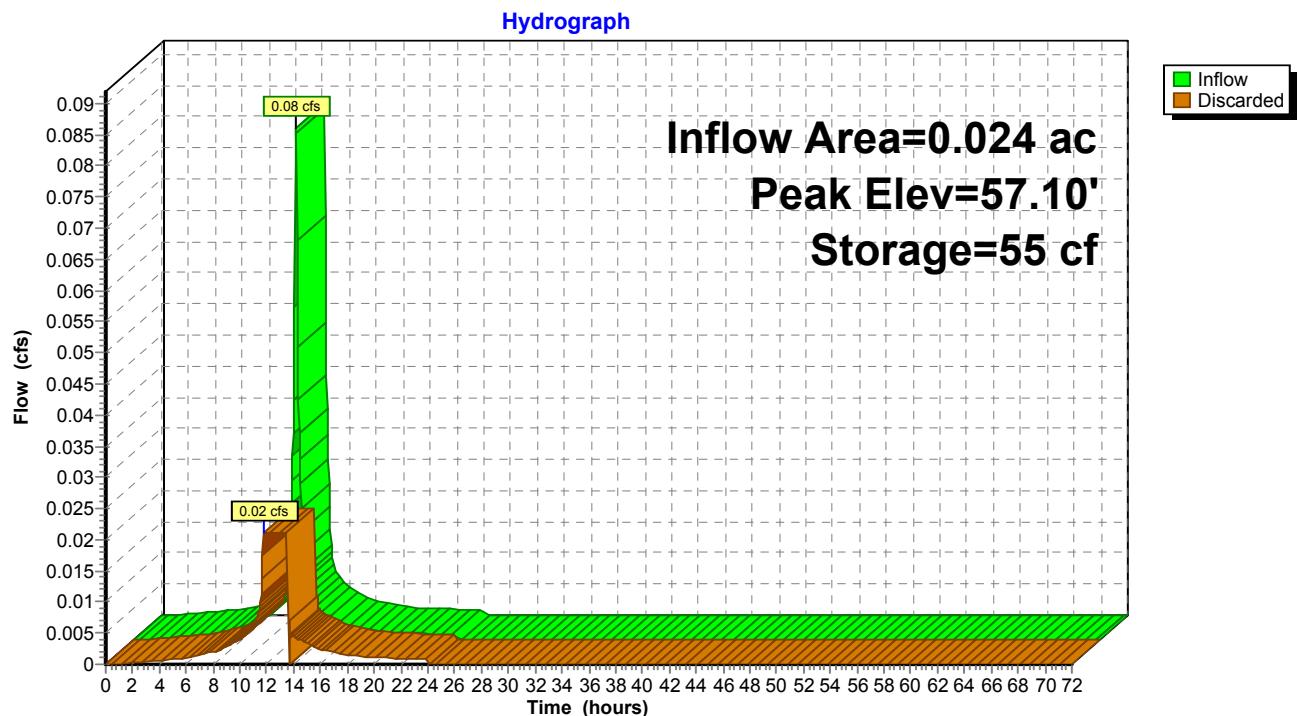
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P4: Infiltration Chambers

Summary for Pond P5: Infiltration Chambers

Inflow Area = 0.039 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
 Outflow = 0.04 cfs @ 11.85 hrs, Volume= 0.011 af, Atten= 70%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.85 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 56.95' @ 12.41 hrs Surf.Area= 208 sf Storage= 77 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 8.5 min (762.5 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	167 cf	4.75'W x 43.75'L x 2.54'H Field A 528 cf Overall - 111 cf Embedded = 418 cf x 40.0% Voids
#2A	56.70'	111 cf	Cultec R-150XLHD x 4 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 1 rows
278 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.85 hrs HW=56.23' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P5: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 1 rows

4 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 41.75' Row Length +12.0" End Stone x 2 = 43.75' Base Length

1 Rows x 33.0" Wide + 12.0" Side Stone x 2 = 4.75' Base Width

6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

4 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 1 Rows = 110.6 cf Chamber Storage

528.2 cf Field - 110.6 cf Chambers = 417.6 cf Stone x 40.0% Voids = 167.0 cf Stone Storage

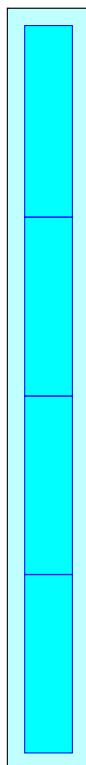
Chamber Storage + Stone Storage = 277.6 cf = 0.006 af

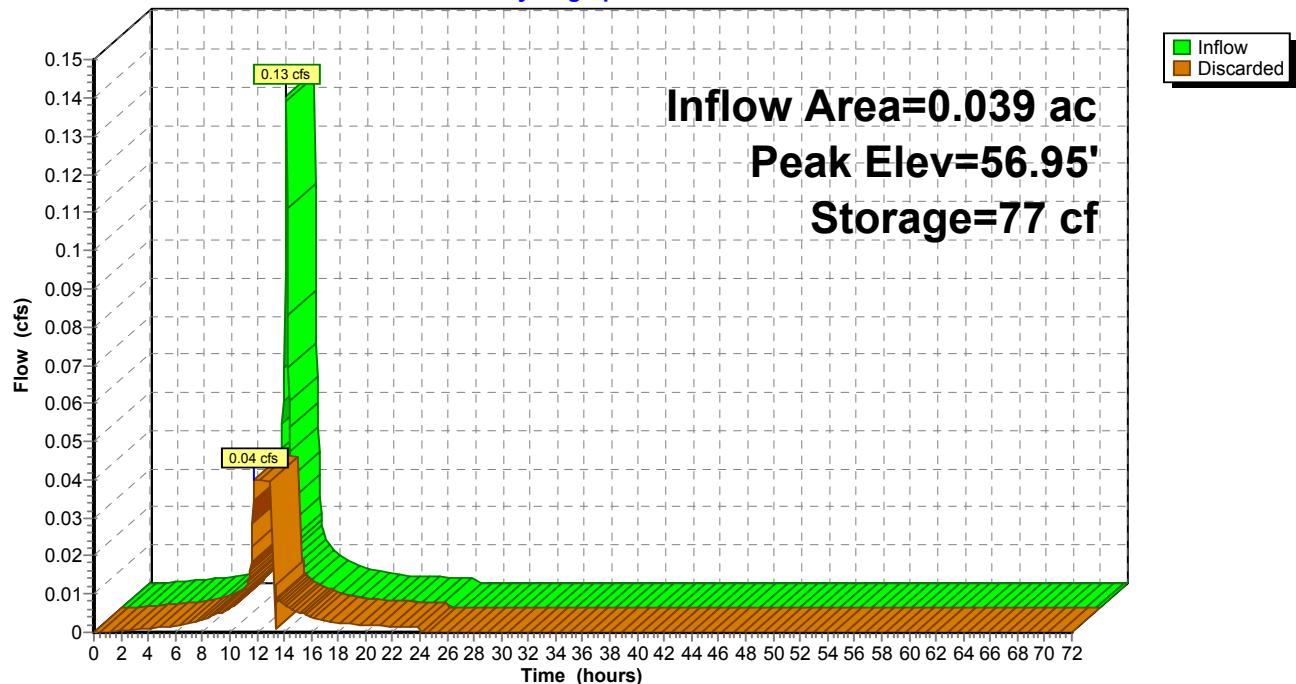
Overall Storage Efficiency = 52.6%

4 Chambers

19.6 cy Field

15.5 cy Stone



Pond P5: Infiltration Chambers**Hydrograph**

Summary for Pond P6: Infiltration Chambers

Inflow Area = 0.019 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.07 cfs @ 12.09 hrs, Volume= 0.005 af
 Outflow = 0.02 cfs @ 11.90 hrs, Volume= 0.005 af, Atten= 68%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.90 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.25' @ 12.38 hrs Surf.Area= 110 sf Storage= 34 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 6.8 min (760.8 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	90 cf	4.75'W x 23.25'L x 2.54'H Field A 281 cf Overall - 56 cf Embedded = 224 cf x 40.0% Voids
#2A	60.10'	56 cf	Cultec R-150XLHD x 2 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 1 rows
146 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.90 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P6: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 1 rows

2 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 21.25' Row Length +12.0" End Stone x 2 = 23.25' Base Length

1 Rows x 33.0" Wide + 12.0" Side Stone x 2 = 4.75' Base Width

6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

2 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 1 Rows = 56.3 cf Chamber Storage

280.7 cf Field - 56.3 cf Chambers = 224.4 cf Stone x 40.0% Voids = 89.8 cf Stone Storage

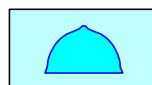
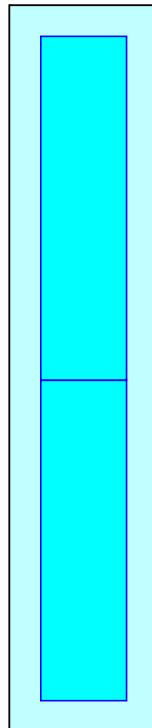
Chamber Storage + Stone Storage = 146.1 cf = 0.003 af

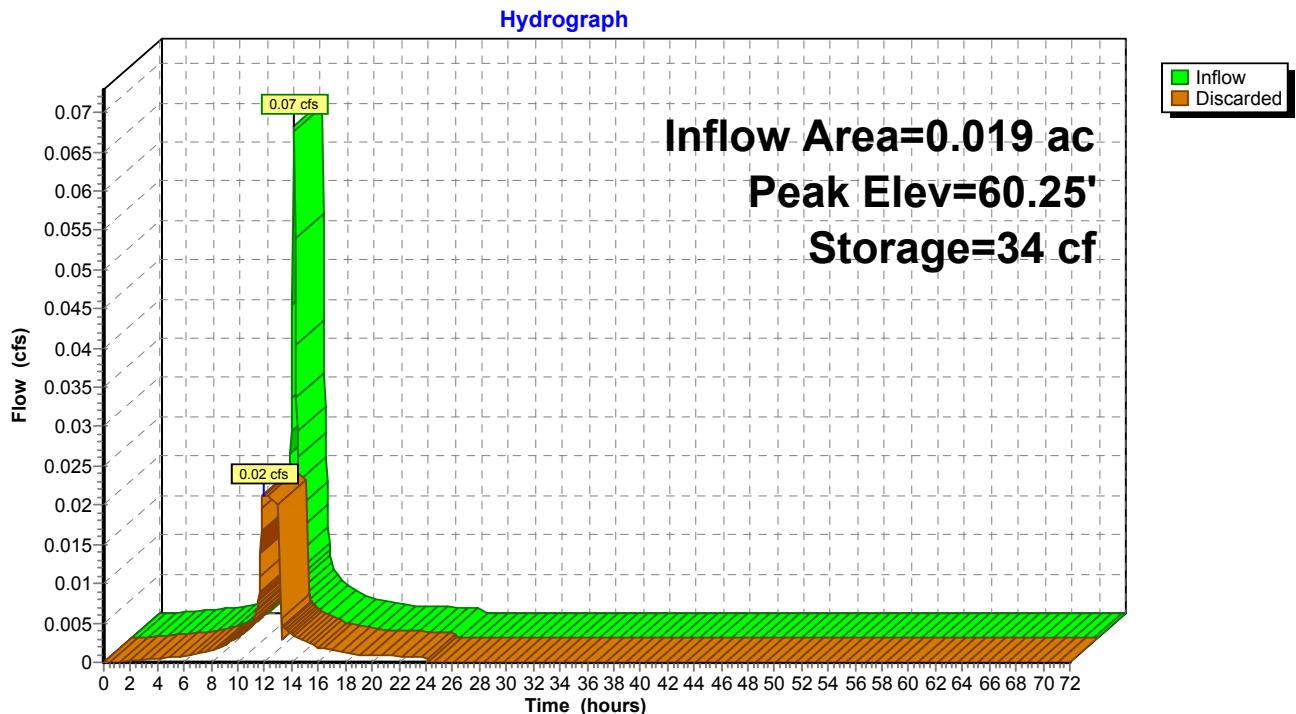
Overall Storage Efficiency = 52.0%

2 Chambers

10.4 cy Field

8.3 cy Stone



Pond P6: Infiltration Chambers

Summary for Pond P7: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af, Atten= 74%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.50' @ 12.45 hrs Surf.Area= 111 sf Storage= 55 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 11.8 min (765.8 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.85 hrs HW=59.66' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P7: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

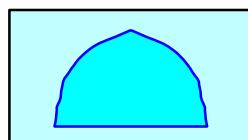
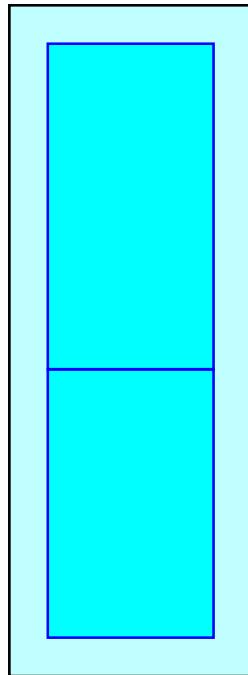
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

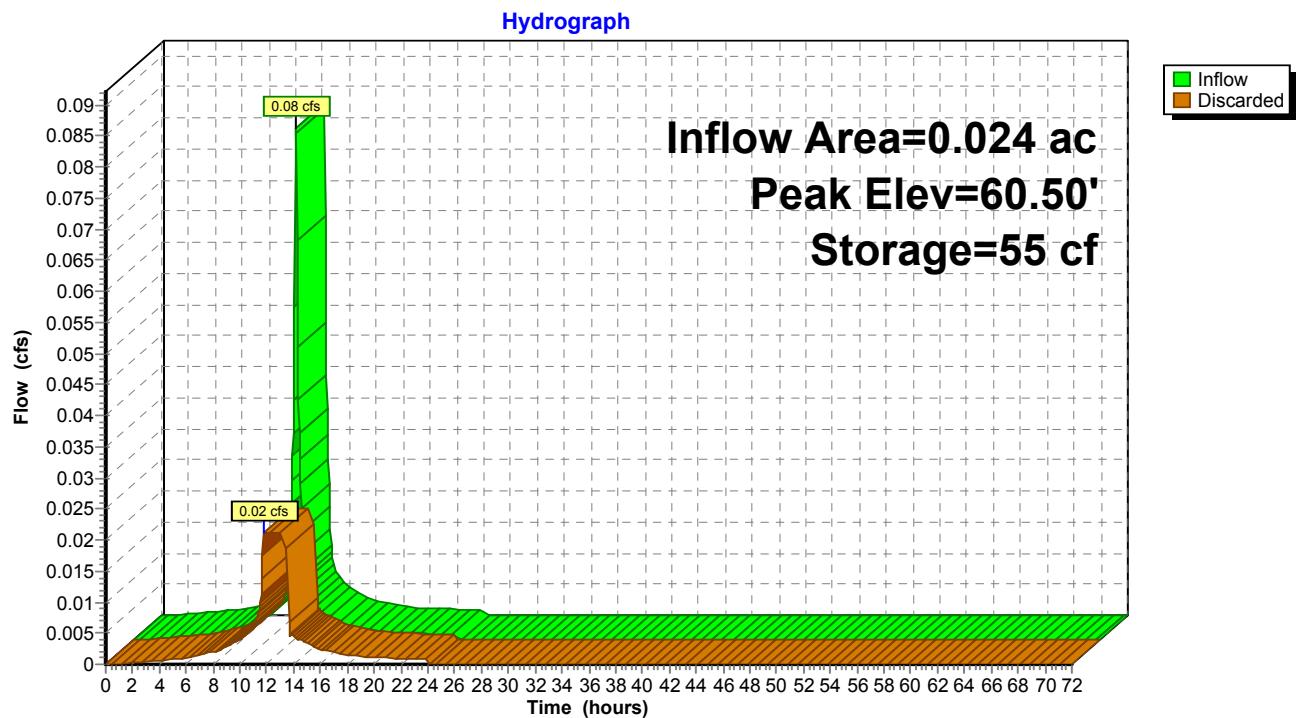
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P7: Infiltration Chambers

Summary for Pond P8: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af, Atten= 74%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.50' @ 12.45 hrs Surf.Area= 111 sf Storage= 55 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 11.8 min (765.8 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.85 hrs HW=59.66' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P8: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

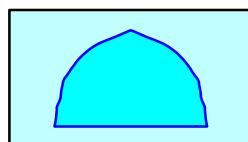
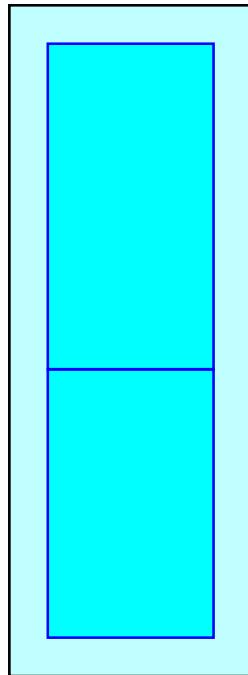
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

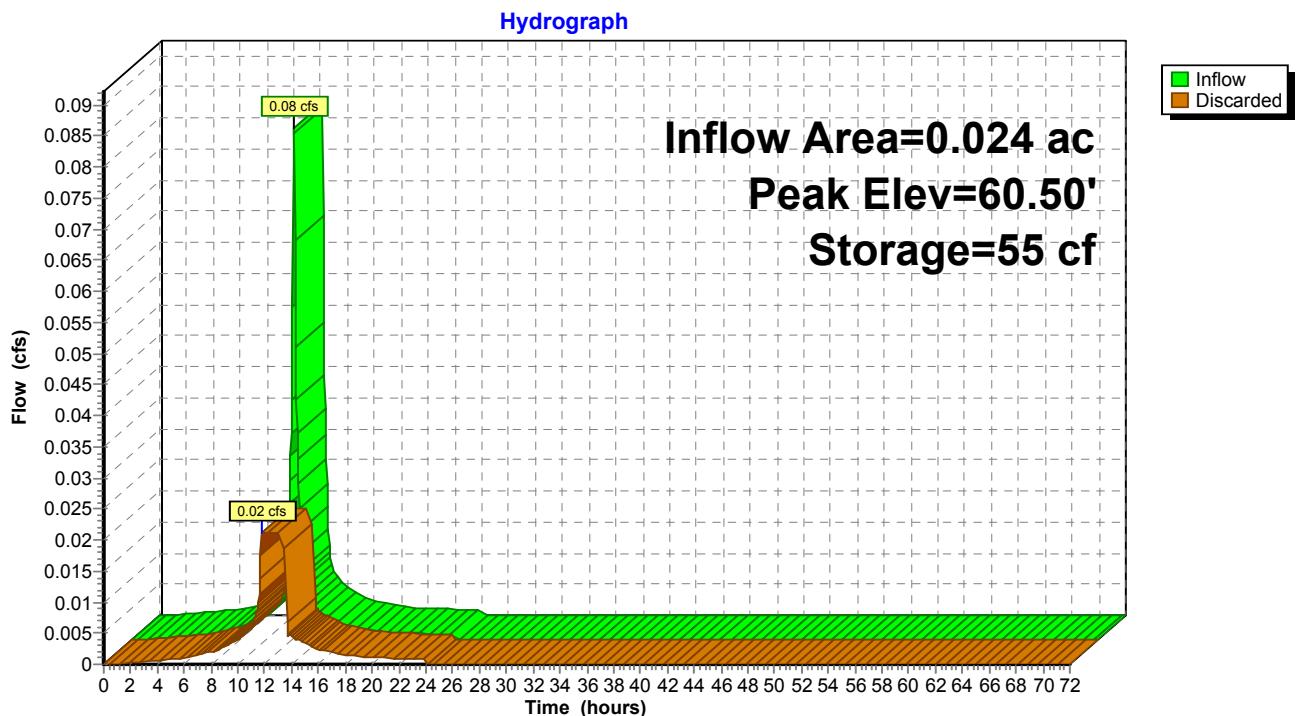
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P8: Infiltration Chambers

Summary for Pond P9: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 3.37" for 2-Year event
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af, Atten= 74%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.85 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.51' @ 12.45 hrs Surf.Area= 111 sf Storage= 55 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 11.8 min (765.8 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.85 hrs HW=59.66' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P9: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

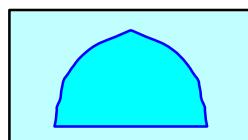
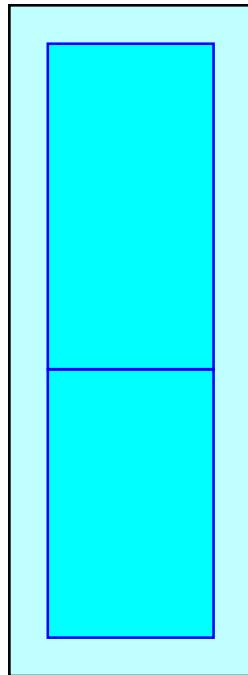
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

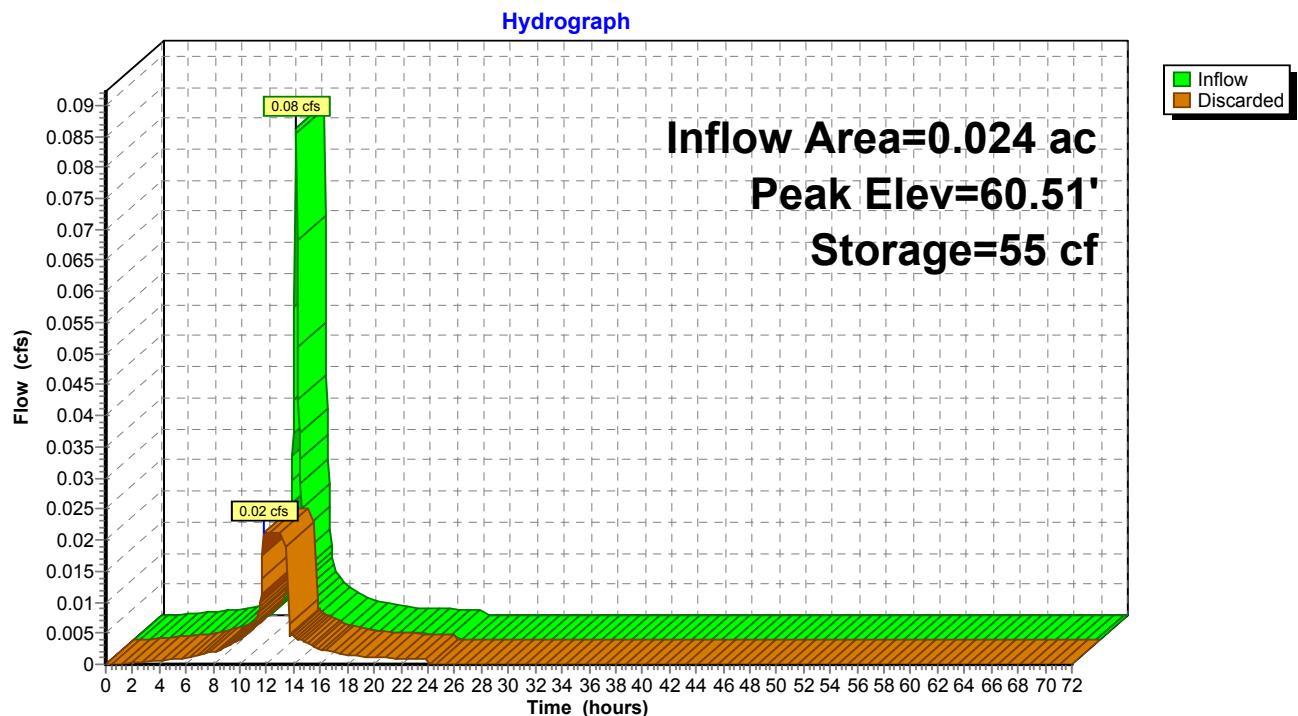
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P9: Infiltration Chambers

Summary for Pond W1: BVW

Inflow Area = 5.027 ac, 50.13% Impervious, Inflow Depth = 0.22" for 2-Year event
 Inflow = 1.18 cfs @ 12.10 hrs, Volume= 0.091 af
 Outflow = 1.15 cfs @ 12.12 hrs, Volume= 0.091 af, Atten= 2%, Lag= 1.0 min
 Primary = 1.15 cfs @ 12.12 hrs, Volume= 0.091 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 56.02' @ 12.12 hrs Surf.Area= 4,219 sf Storage= 101 cf

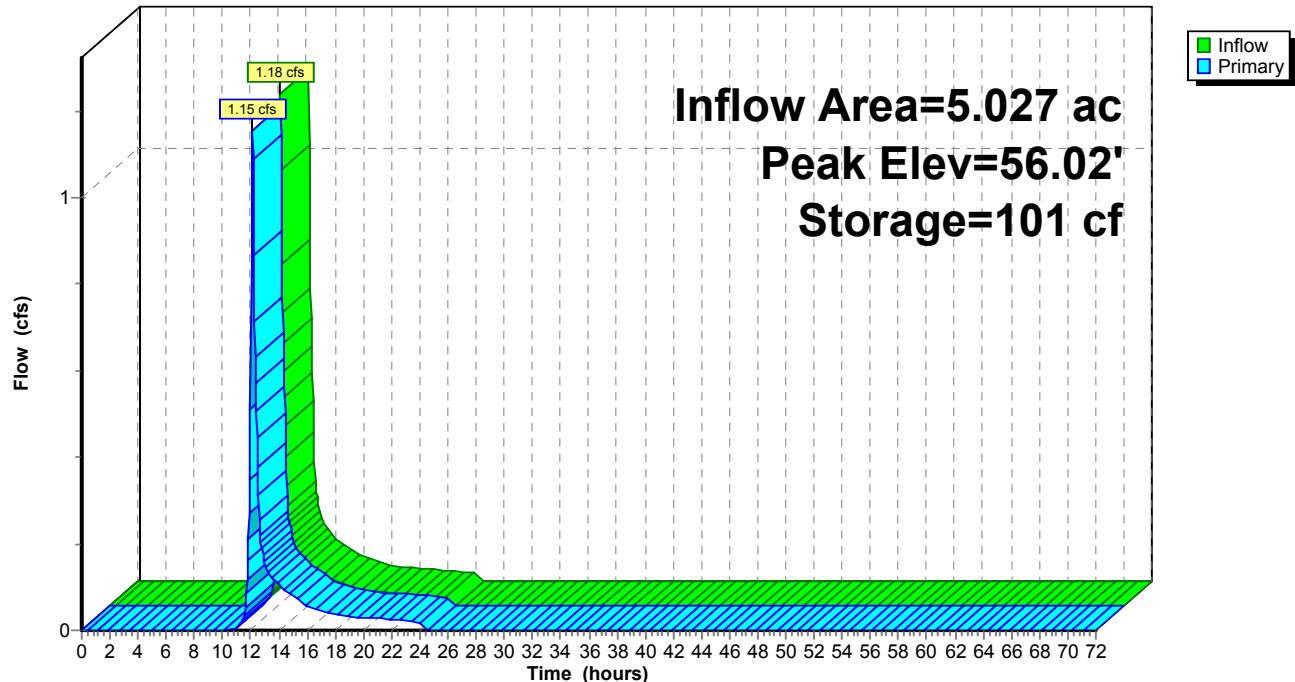
Plug-Flow detention time= 2.9 min calculated for 0.091 af (100% of inflow)
 Center-of-Mass det. time= 3.0 min (867.1 - 864.2)

Volume	Invert	Avail.Storage	Storage Description	
#1	56.00'	11,314 cf	Custom Stage Data (Irregular)	Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	3,962	413.1	0	0	3,962
57.00	20,884	797.8	11,314	11,314	41,037

Device	Routing	Invert	Outlet Devices	
#1	Primary	56.00'	120.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64	

Primary OutFlow Max=1.12 cfs @ 12.12 hrs HW=56.02' TW=0.00' (Dynamic Tailwater)
 ↑1=Broad-Crested Rectangular Weir(Weir Controls 1.12 cfs @ 0.39 fps)

Pond W1: BVW**Hydrograph**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Sub-1	Runoff Area=11,515 sf 47.75% Impervious Runoff Depth=1.67" Tc=6.0 min CN=67 Runoff=0.49 cfs 0.037 af
Subcatchment2S: Sub-2	Runoff Area=8,566 sf 7.82% Impervious Runoff Depth=0.34" Tc=6.0 min CN=44 Runoff=0.03 cfs 0.006 af
Subcatchment3A-10R: Roofs 15 B	Runoff Area=857 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af
Subcatchment3A-10R1: Roofs 15 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment3A-11R: Roofs 16-17 FB	Runoff Area=3,806 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.40 cfs 0.033 af
Subcatchment3A-12R: Roofs 18-21 F	Runoff Area=4,201 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.44 cfs 0.037 af
Subcatchment3A-12R1: Roofs 22-24 F	Runoff Area=3,124 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.33 cfs 0.027 af
Subcatchment3A-14R: Roofs 25-28 F	Runoff Area=4,152 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.44 cfs 0.036 af
Subcatchment3A-14R1: Roofs 29-30 B	Runoff Area=1,686 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af
Subcatchment3A-14R2: Roofs 31-32 B	Runoff Area=1,707 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af
Subcatchment3A-15R: Roofs 29-30 F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment3A-16R: Roofs 29-30 F	Runoff Area=1,057 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment3A-17R: Roofs 31-32 F	Runoff Area=1,043 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment3A-18R: Roofs 31-32 F	Runoff Area=1,041 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment3A-1R: Roof 5	Runoff Area=1,903 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.20 cfs 0.017 af
Subcatchment3A-2R: Roofs 1-4 FB	Runoff Area=7,608 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.80 cfs 0.066 af

Subcatchment3A-2R1: Roofs 6-9 FB	Runoff Area=7,608 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.80 cfs 0.066 af
Subcatchment3A-3R: Roofs 10-F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment3A-4R: Roofs 11 F	Runoff Area=1,045 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment3A-5R: Roofs 10-11 B	Runoff Area=1,707 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af
Subcatchment3A-6R: Roofs 12 B	Runoff Area=829 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af
Subcatchment3A-7R: Roofs 12 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment3A-8R: Roofs 13 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment3A-9R: Roofs 14 F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment3A-S: Sub-3A	Runoff Area=160,799 sf 55.72% Impervious Runoff Depth=2.12" Tc=6.0 min CN=73 Runoff=8.94 cfs 0.654 af
Subcatchment3B-S: Sub-3B	Runoff Area=42,013 sf 40.23% Impervious Runoff Depth=1.97" Tc=6.0 min CN=71 Runoff=2.15 cfs 0.158 af
Subcatchment3C-S: Sub-3C	Runoff Area=16,169 sf 20.21% Impervious Runoff Depth=0.94" Tc=6.0 min CN=56 Runoff=0.32 cfs 0.029 af
Subcatchment4S-1: Sub-4	Runoff Area=11,741 sf 37.46% Impervious Runoff Depth=1.25" Tc=6.0 min CN=61 Runoff=0.35 cfs 0.028 af
Subcatchment4S-1R: Roofs 22-24 B	Runoff Area=2,596 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.27 cfs 0.023 af
Subcatchment4S-2: Sub-4	Runoff Area=3,394 sf 9.16% Impervious Runoff Depth=0.34" Tc=6.0 min CN=44 Runoff=0.01 cfs 0.002 af
Subcatchment5S: Sub -5	Runoff Area=13,253 sf 9.23% Impervious Runoff Depth=0.38" Tc=6.0 min CN=45 Runoff=0.05 cfs 0.010 af
Subcatchment5S-1R: Roofs 18-21 B	Runoff Area=3,407 sf 100.00% Impervious Runoff Depth=4.56" Tc=6.0 min CN=98 Runoff=0.36 cfs 0.030 af
Reach DP-1: DMH	Inflow=0.49 cfs 0.037 af Outflow=0.49 cfs 0.037 af

Reach DP-2: DP-2	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach DP-3: DP-3	Inflow=2.12 cfs 0.419 af Outflow=2.12 cfs 0.419 af
Reach DP-4: PL	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach DP-5: PL	Inflow=0.05 cfs 0.010 af Outflow=0.05 cfs 0.010 af
Pond D-1: Depression	Peak Elev=59.00' Storage=1 cf Inflow=0.03 cfs 0.006 af Discarded=0.03 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.006 af
Pond D-2: Depression	Peak Elev=58.17' Storage=127 cf Inflow=0.32 cfs 0.029 af Discarded=0.15 cfs 0.029 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.029 af
Pond D-3: Depression	Peak Elev=63.52' Storage=477 cf Inflow=0.35 cfs 0.028 af Discarded=0.03 cfs 0.028 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.028 af
Pond D-4: Depression	Peak Elev=59.14' Storage=96 cf Inflow=0.01 cfs 0.002 af Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Pond DB-1: Prop Detention Basin	Peak Elev=60.38' Storage=18,965 cf Inflow=8.94 cfs 0.654 af Outflow=0.52 cfs 0.261 af
Pond P1: Infiltration Chambers	Peak Elev=57.60' Storage=172 cf Inflow=0.20 cfs 0.017 af Outflow=0.04 cfs 0.017 af
Pond P10: Infiltration Chambers	Peak Elev=60.99' Storage=171 cf Inflow=0.20 cfs 0.017 af Outflow=0.04 cfs 0.017 af
Pond P11: Infiltration Chambers	Peak Elev=64.79' Storage=383 cf Inflow=0.40 cfs 0.033 af Outflow=0.06 cfs 0.033 af
Pond P12: Infiltration Chambers	Peak Elev=57.14' Storage=545 cf Inflow=0.77 cfs 0.064 af Outflow=0.19 cfs 0.064 af
Pond P13: Infiltration Chambers	Peak Elev=56.91' Storage=365 cf Inflow=0.63 cfs 0.052 af Outflow=0.19 cfs 0.052 af
Pond P14: Infiltration Chambers	Peak Elev=60.19' Storage=756 cf Inflow=0.79 cfs 0.066 af Outflow=0.13 cfs 0.066 af
Pond P15: Infiltration Chambers	Peak Elev=61.00' Storage=94 cf Inflow=0.11 cfs 0.009 af Outflow=0.02 cfs 0.009 af
Pond P16: Infiltration Chambers	Peak Elev=61.01' Storage=95 cf Inflow=0.11 cfs 0.009 af Outflow=0.02 cfs 0.009 af

27-135 Post-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

*Type III 24-hr 10-Year Rainfall=4.80"*Page 120**Pond P17: Infiltration Chambers**Peak Elev=60.99' Storage=93 cf Inflow=0.11 cfs 0.009 af
Outflow=0.02 cfs 0.009 af**Pond P18: Infiltration Chambers**Peak Elev=60.98' Storage=93 cf Inflow=0.11 cfs 0.009 af
Outflow=0.02 cfs 0.009 af**Pond P2: Infiltration Chambers**Peak Elev=57.77' Storage=1,496 cf Inflow=1.60 cfs 0.133 af
Outflow=0.27 cfs 0.133 af**Pond P3: Infiltration Chambers**Peak Elev=57.60' Storage=94 cf Inflow=0.11 cfs 0.009 af
Outflow=0.02 cfs 0.009 af**Pond P4: Infiltration Chambers**Peak Elev=57.59' Storage=93 cf Inflow=0.11 cfs 0.009 af
Outflow=0.02 cfs 0.009 af**Pond P5: Infiltration Chambers**Peak Elev=57.38' Storage=137 cf Inflow=0.18 cfs 0.015 af
Outflow=0.04 cfs 0.015 af**Pond P6: Infiltration Chambers**Peak Elev=60.64' Storage=62 cf Inflow=0.09 cfs 0.007 af
Outflow=0.02 cfs 0.007 af**Pond P7: Infiltration Chambers**Peak Elev=60.99' Storage=94 cf Inflow=0.11 cfs 0.009 af
Outflow=0.02 cfs 0.009 af**Pond P8: Infiltration Chambers**Peak Elev=60.99' Storage=94 cf Inflow=0.11 cfs 0.009 af
Outflow=0.02 cfs 0.009 af**Pond P9: Infiltration Chambers**Peak Elev=61.00' Storage=94 cf Inflow=0.11 cfs 0.009 af
Outflow=0.02 cfs 0.009 af**Pond W1: BVW**Peak Elev=56.04' Storage=153 cf Inflow=2.15 cfs 0.419 af
Outflow=2.12 cfs 0.419 af**Total Runoff Area = 7.418 ac Runoff Volume = 1.409 af Average Runoff Depth = 2.28"**
45.06% Pervious = 3.342 ac 54.94% Impervious = 4.076 ac

Summary for Subcatchment 1S: Sub-1

Runoff = 0.49 cfs @ 12.10 hrs, Volume= 0.037 af, Depth= 1.67"

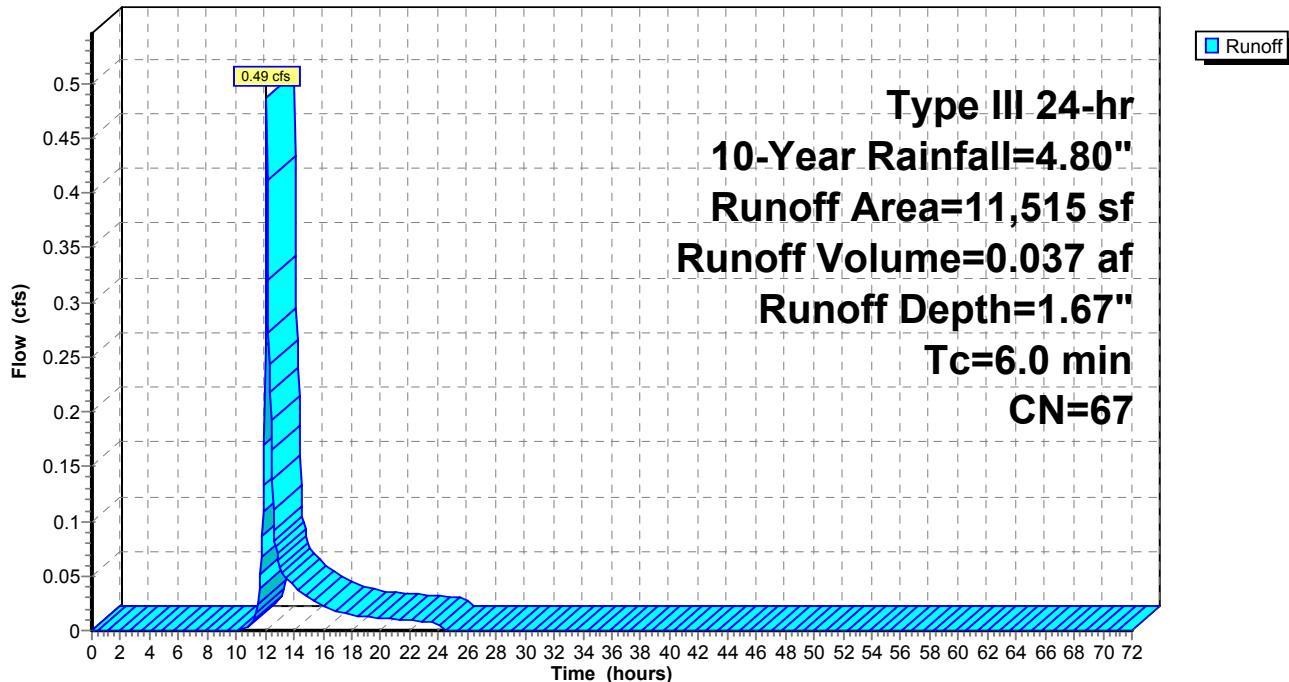
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
*		
5,498	98	Paved roads w/curbs & sewers, HSG A
6,017	39	>75% Grass cover, Good, HSG A
11,515	67	Weighted Average
6,017		52.25% Pervious Area
5,498		47.75% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 1S: Sub-1

Hydrograph



Summary for Subcatchment 2S: Sub-2

Runoff = 0.03 cfs @ 12.36 hrs, Volume= 0.006 af, Depth= 0.34"

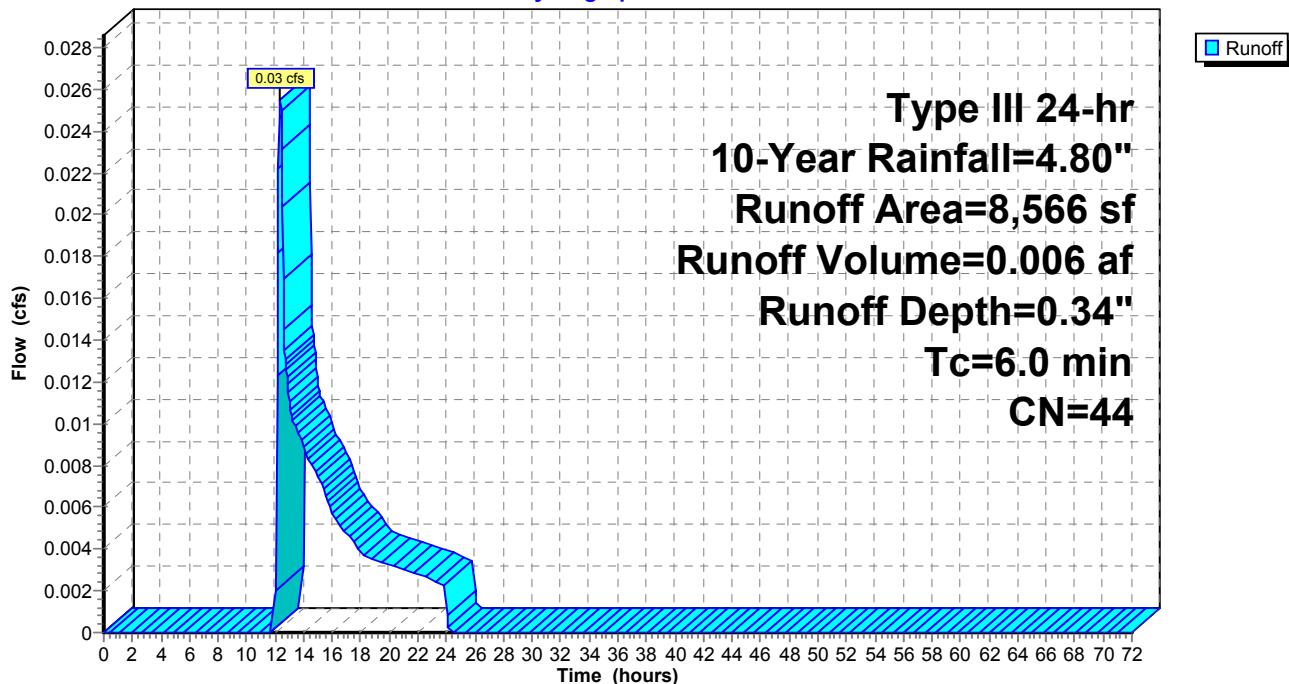
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
7,754	39	>75% Grass cover, Good, HSG A
*	100	Walls, HSG A
*	570	Decks, HSG A
142	39	>75% Grass cover, Good, HSG A
8,566	44	Weighted Average
7,896		92.18% Pervious Area
670		7.82% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 2S: Sub-2

Hydrograph



Summary for Subcatchment 3A-10R: Roofs 15 B

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 4.56"

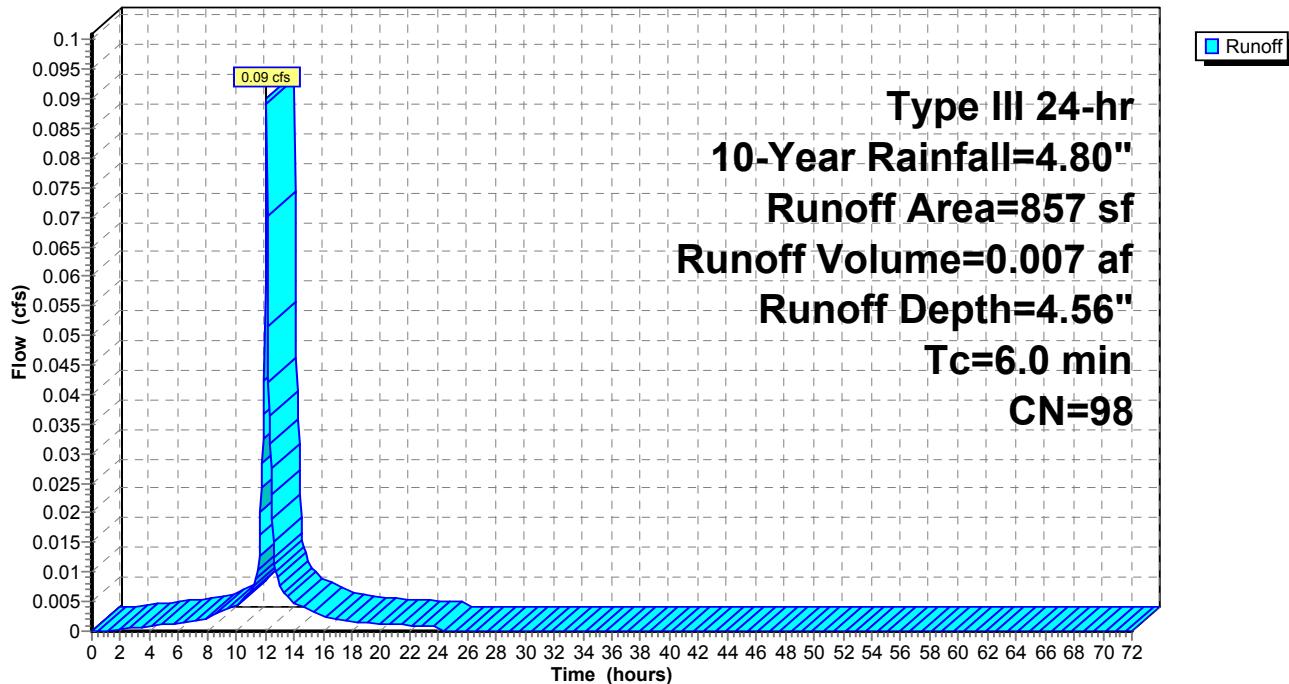
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
857	98	Roofs, HSG A
857		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-10R: Roofs 15 B

Hydrograph



Summary for Subcatchment 3A-10R1: Roofs 15 F

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 4.56"

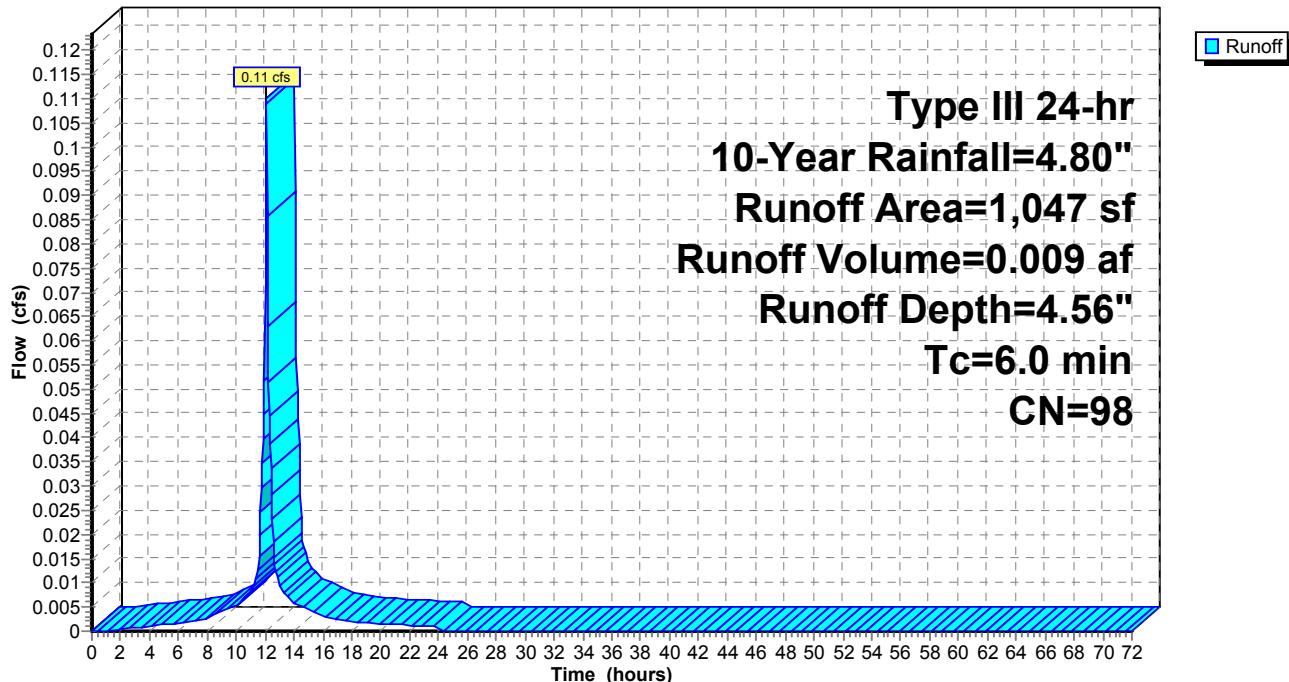
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
1,047	98	Roofs, HSG A
1,047		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-10R1: Roofs 15 F

Hydrograph



Summary for Subcatchment 3A-11R: Roofs 16-17 FB

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 0.033 af, Depth= 4.56"

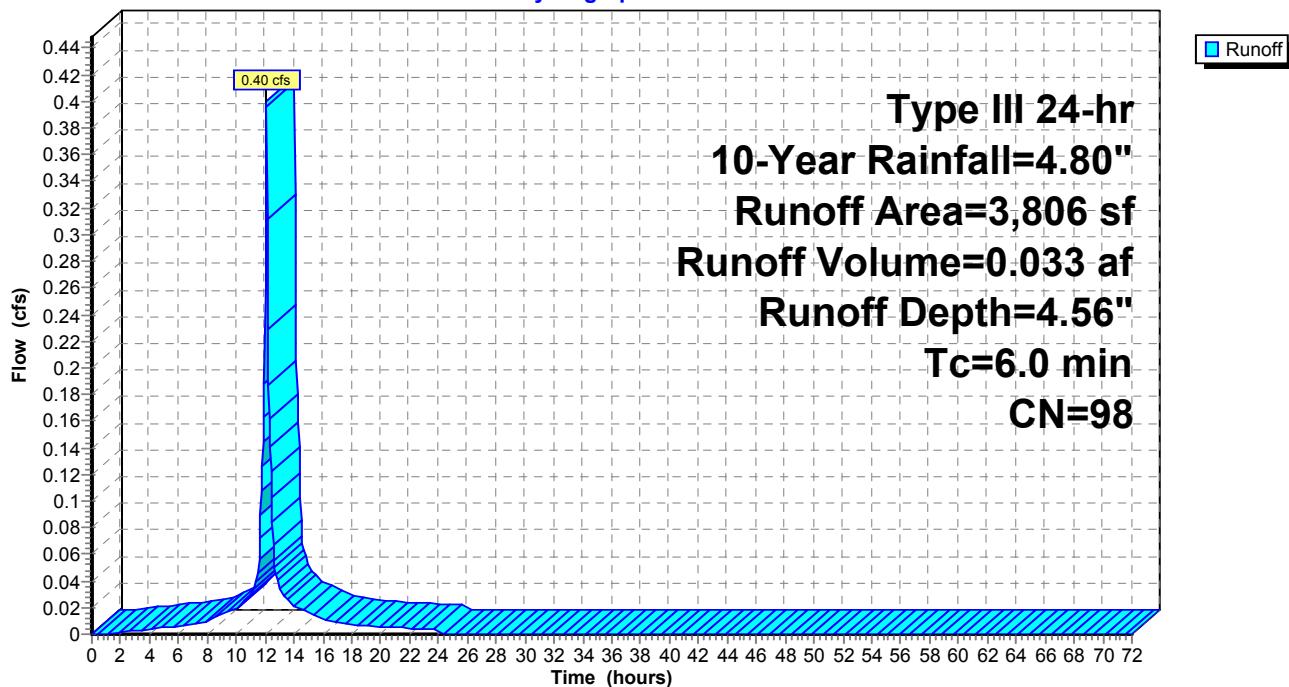
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
3,806	98	Roofs, HSG A
3,806		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-11R: Roofs 16-17 FB

Hydrograph



Summary for Subcatchment 3A-12R: Roofs 18-21 F

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.037 af, Depth= 4.56"

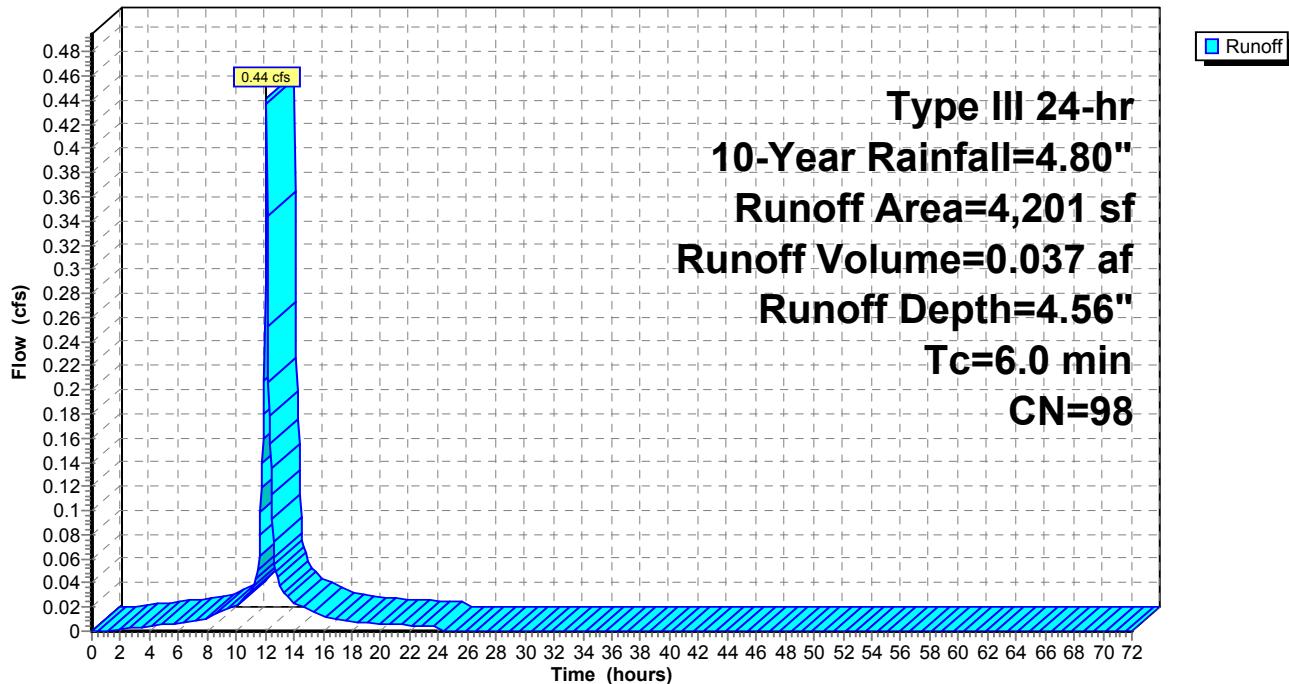
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
4,201	98	Roofs, HSG A
4,201		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-12R: Roofs 18-21 F

Hydrograph



Summary for Subcatchment 3A-12R1: Roofs 22-24 F

Runoff = 0.33 cfs @ 12.09 hrs, Volume= 0.027 af, Depth= 4.56"

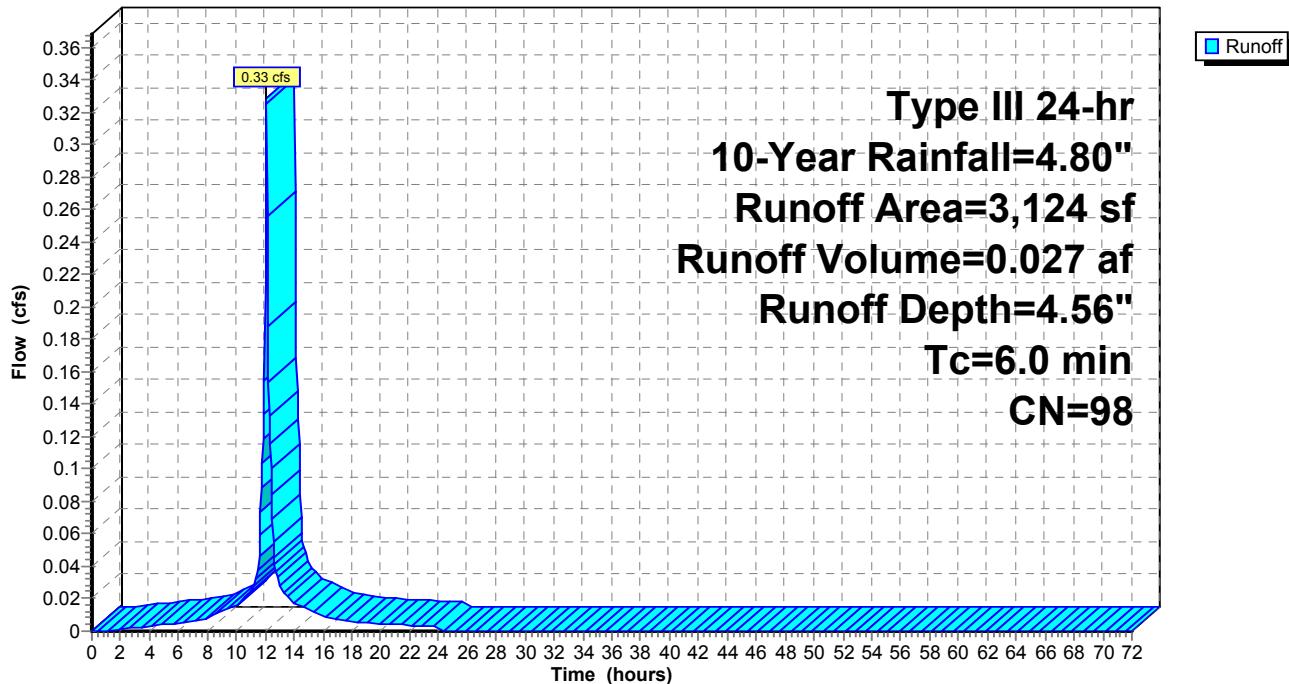
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
3,124	98	Roofs, HSG A
3,124		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-12R1: Roofs 22-24 F

Hydrograph



Summary for Subcatchment 3A-14R: Roofs 25-28 F

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.036 af, Depth= 4.56"

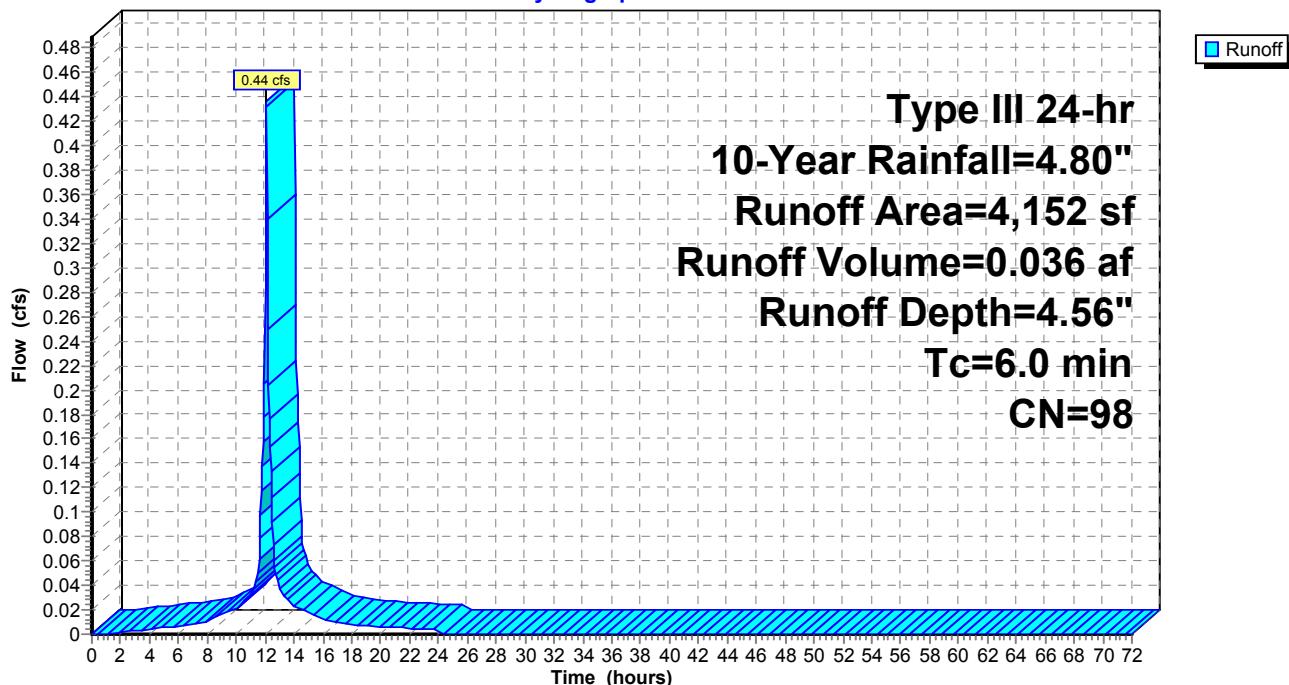
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
4,152	98	Roofs, HSG A
4,152		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R: Roofs 25-28 F

Hydrograph



Summary for Subcatchment 3A-14R1: Roofs 29-30 B

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 4.56"

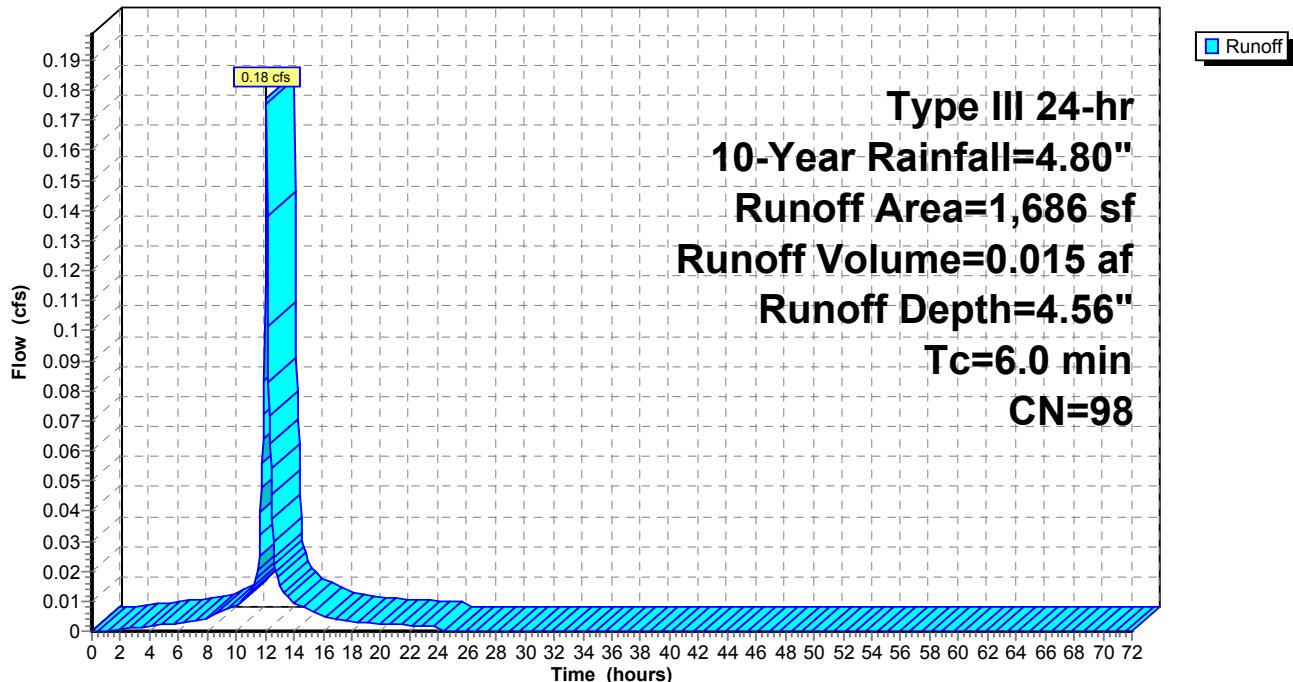
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
1,686	98	Roofs, HSG A
1,686		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R1: Roofs 29-30 B

Hydrograph



Summary for Subcatchment 3A-14R2: Roofs 31-32 B

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 4.56"

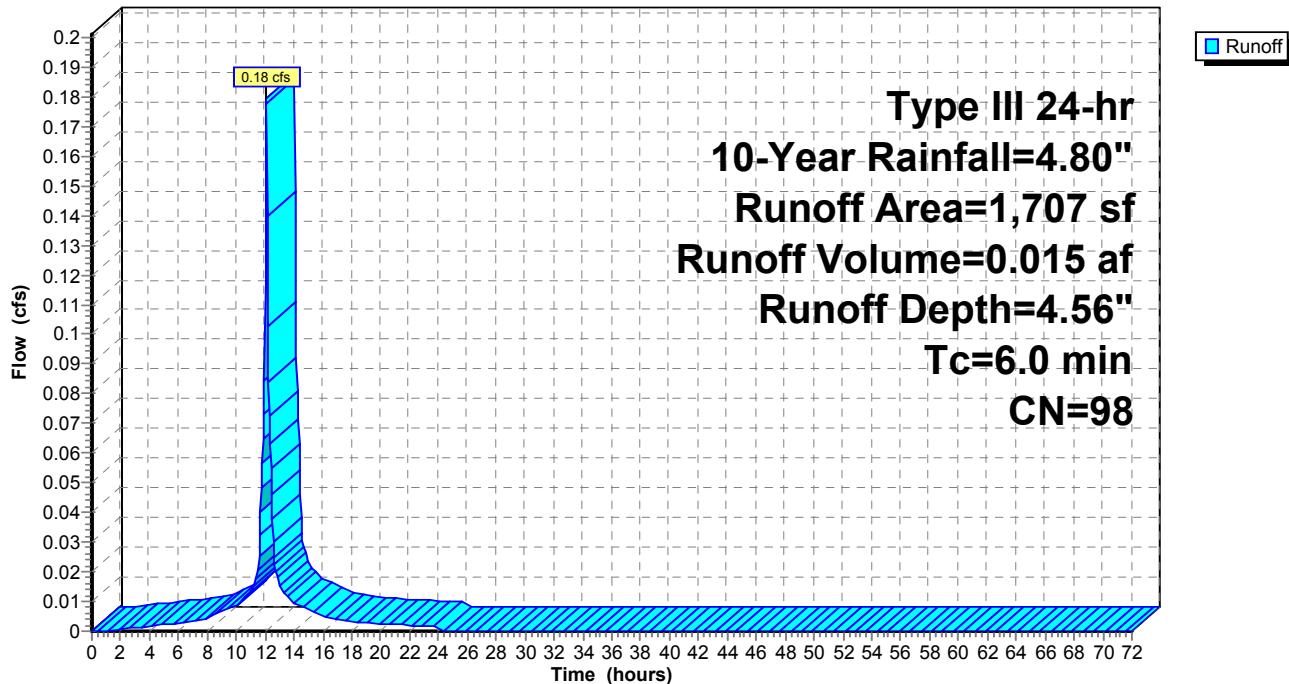
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
1,707	98	Roofs, HSG A
1,707		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R2: Roofs 31-32 B

Hydrograph



Summary for Subcatchment 3A-15R: Roofs 29-30 F

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 4.56"

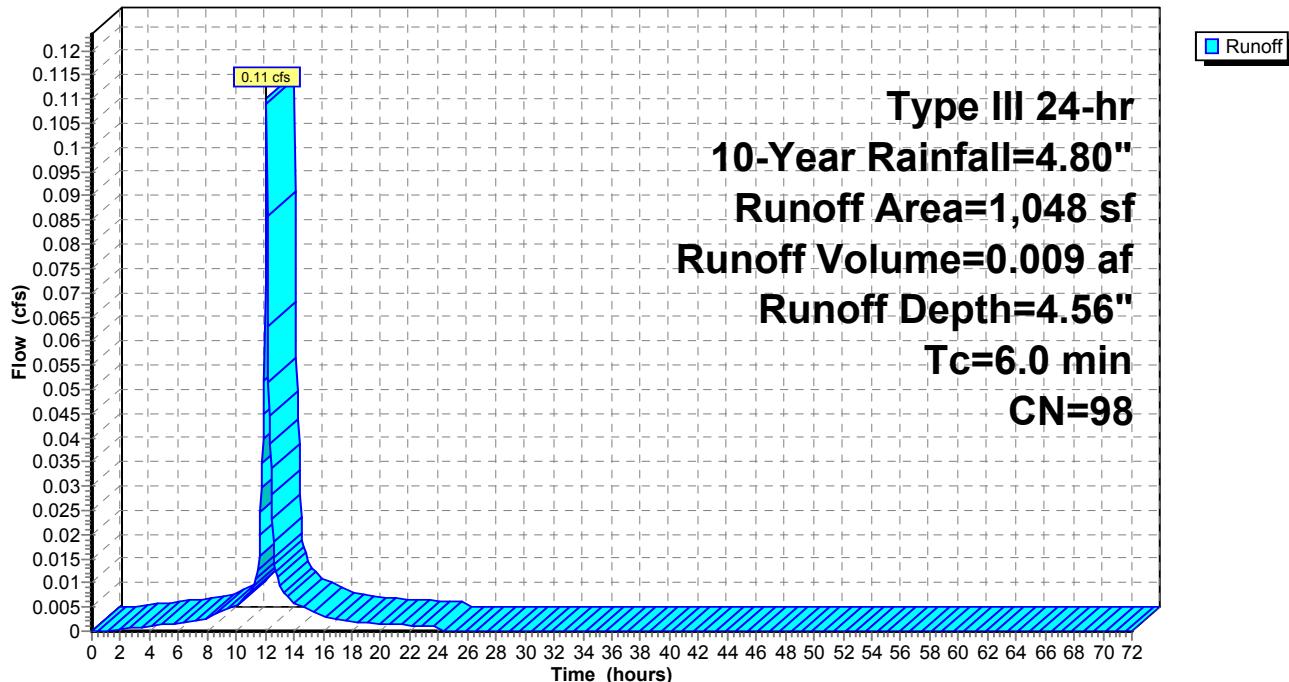
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
1,048	98	Roofs, HSG A
1,048		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-15R: Roofs 29-30 F

Hydrograph



Summary for Subcatchment 3A-16R: Roofs 29-30 F

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 4.56"

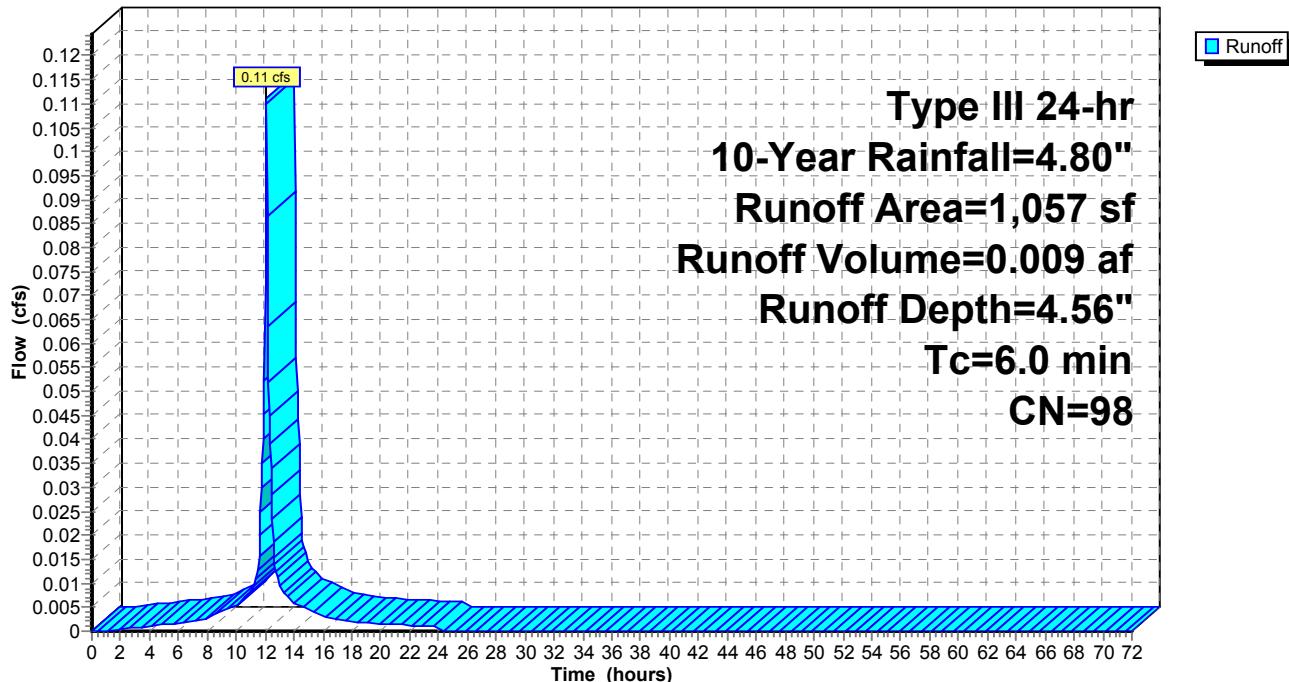
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
1,057	98	Roofs, HSG A
1,057		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-16R: Roofs 29-30 F

Hydrograph



Summary for Subcatchment 3A-17R: Roofs 31-32 F

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 4.56"

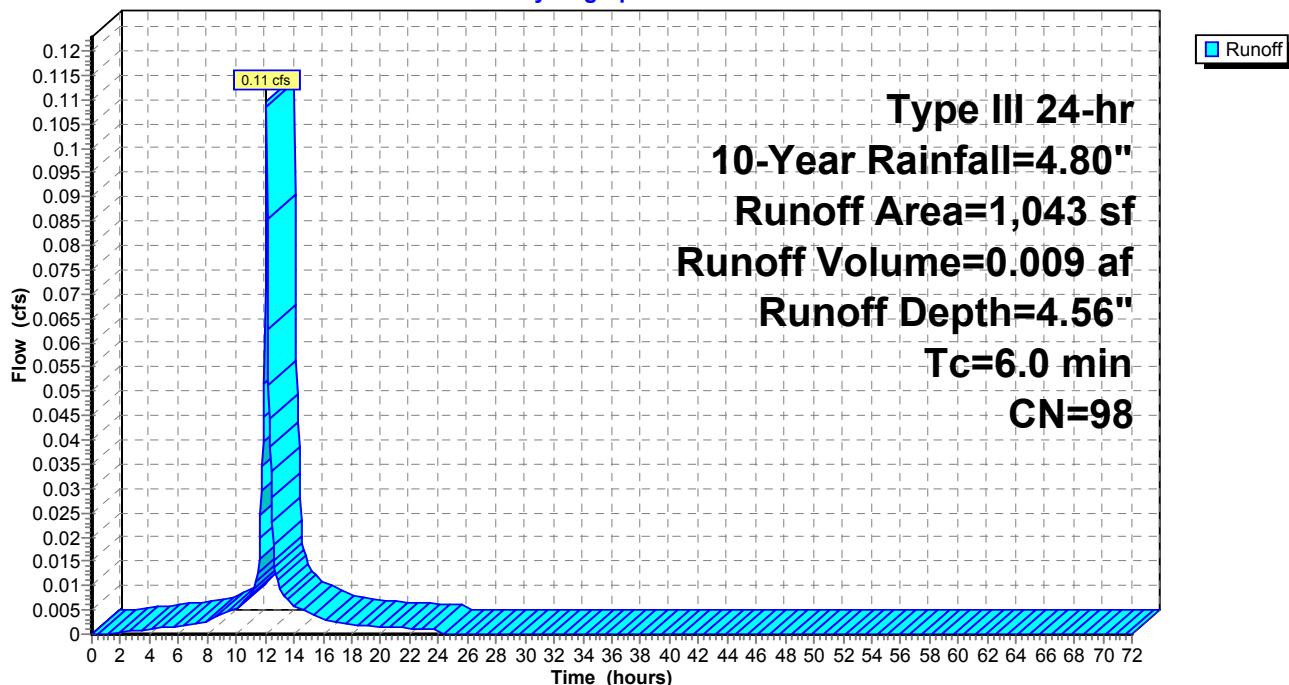
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
1,043	98	Roofs, HSG A
1,043		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-17R: Roofs 31-32 F

Hydrograph



Summary for Subcatchment 3A-18R: Roofs 31-32 F

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 4.56"

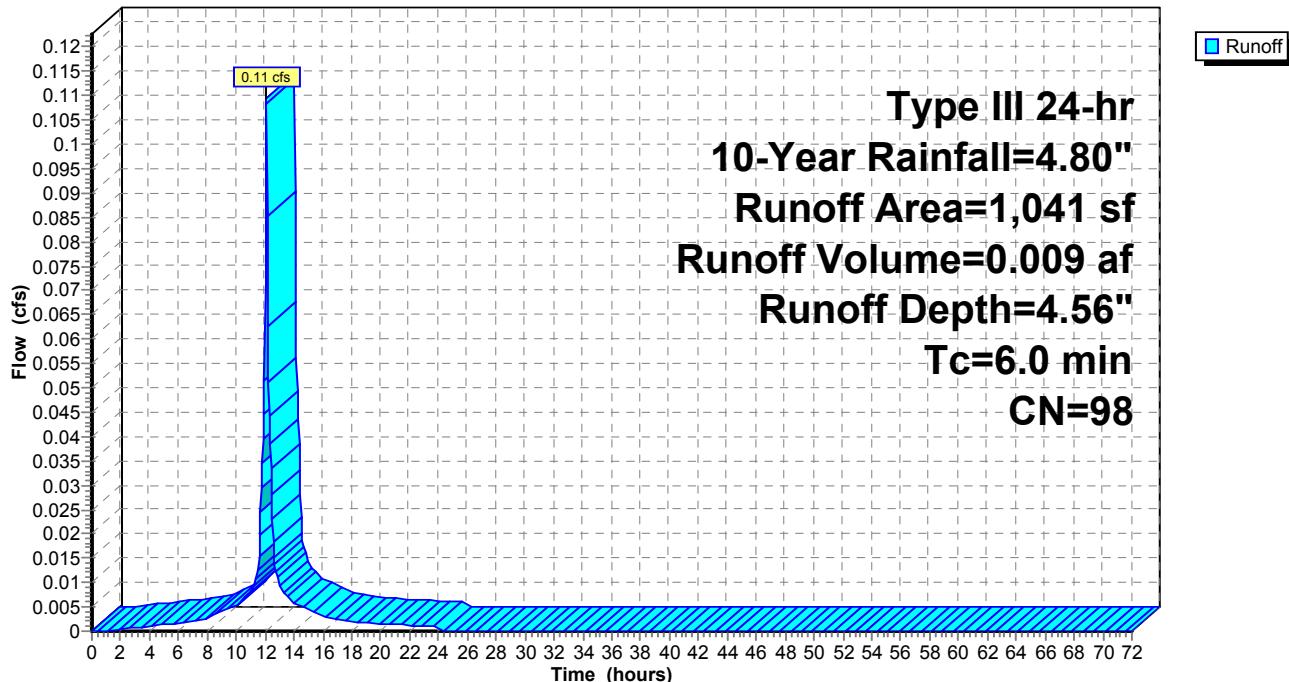
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
1,041	98	Roofs, HSG A
1,041		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-18R: Roofs 31-32 F

Hydrograph



Summary for Subcatchment 3A-1R: Roof 5

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 4.56"

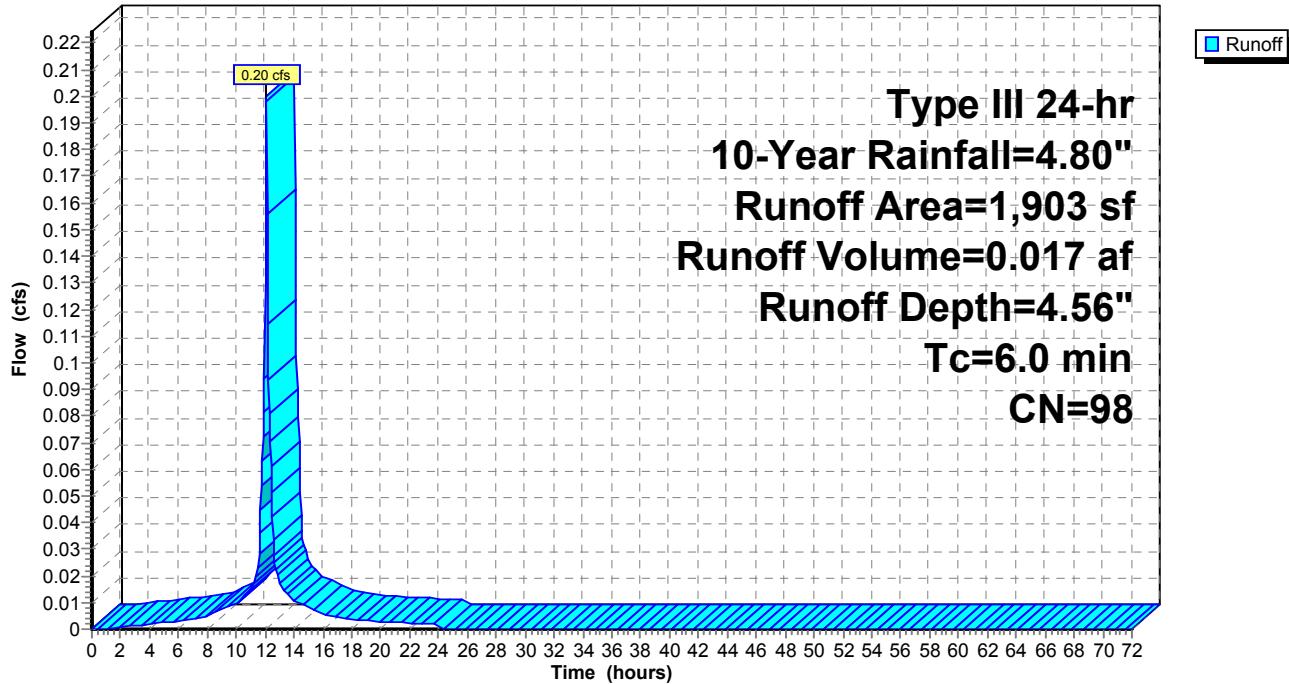
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
690	98	Roofs, HSG A
*	1,213	Roofs, HSG B
1,903	98	Weighted Average
1,903		100.00% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 3A-1R: Roof 5

Hydrograph



Summary for Subcatchment 3A-2R: Roofs 1-4 FB

Runoff = 0.80 cfs @ 12.09 hrs, Volume= 0.066 af, Depth= 4.56"

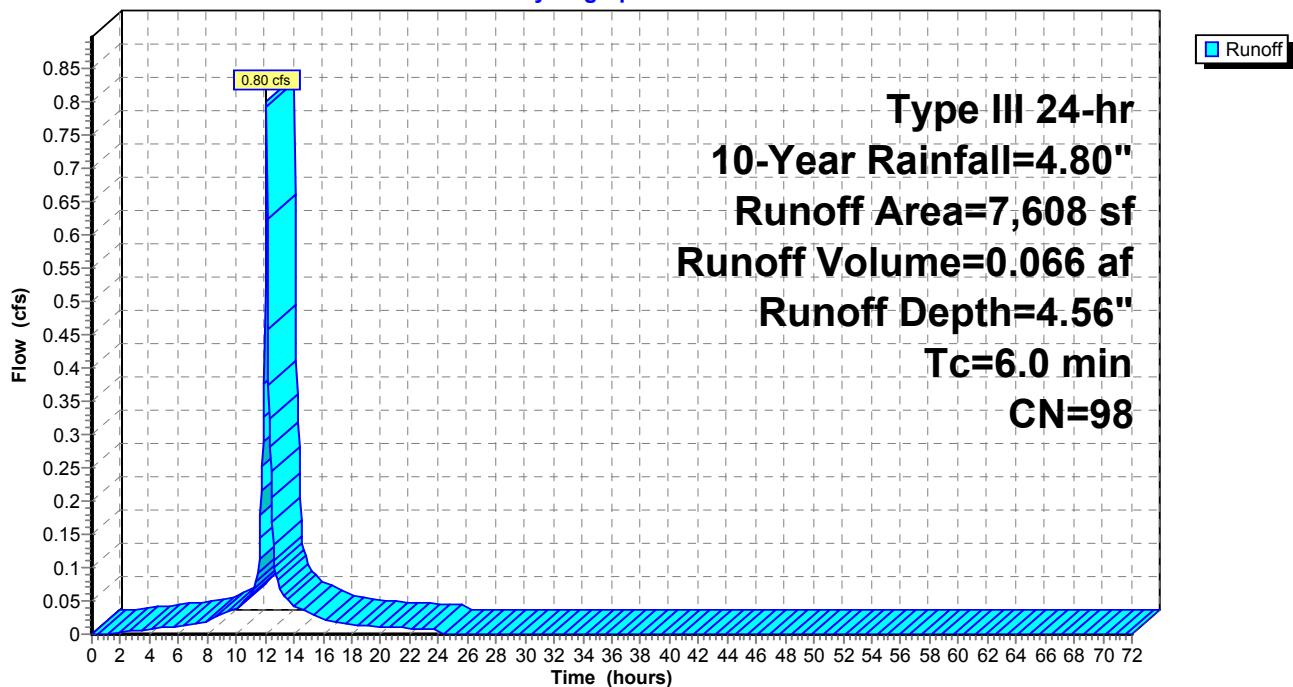
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
7,608	98	Roofs, HSG A
7,608		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-2R: Roofs 1-4 FB

Hydrograph



Summary for Subcatchment 3A-2R1: Roofs 6-9 FB

Runoff = 0.80 cfs @ 12.09 hrs, Volume= 0.066 af, Depth= 4.56"

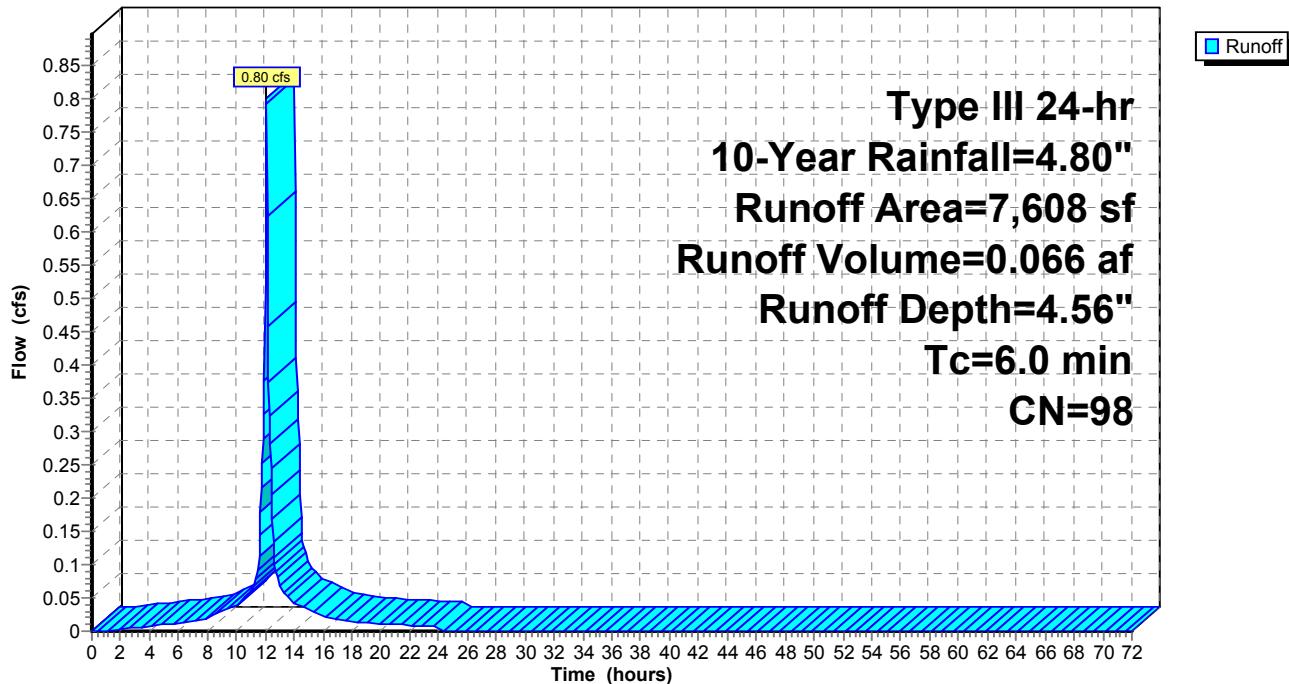
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
7,608	98	Roofs, HSG A
7,608		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-2R1: Roofs 6-9 FB

Hydrograph



Summary for Subcatchment 3A-3R: Roofs 10-F

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 4.56"

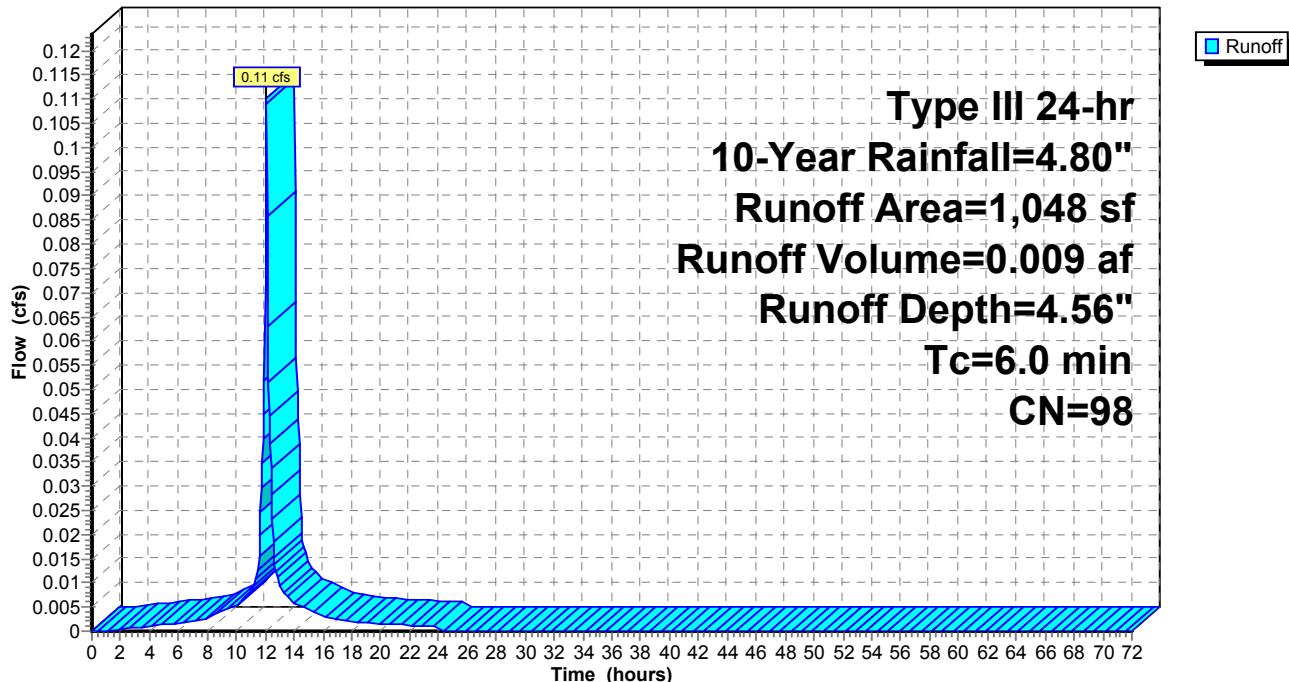
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
*	1,048	98 Roofs, HSG B
	1,048	100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-3R: Roofs 10-F

Hydrograph



Summary for Subcatchment 3A-4R: Roofs 11 F

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 4.56"

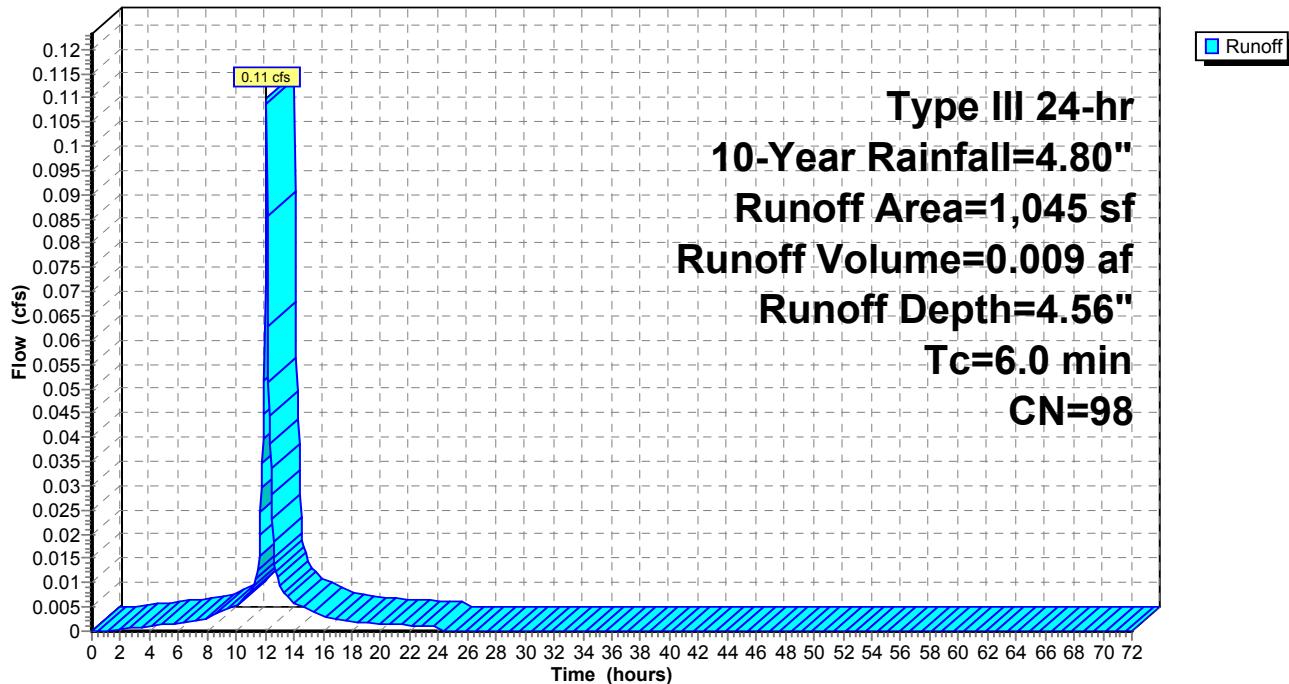
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	1,045	98	Roofs, HSG B
	1,045		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-4R: Roofs 11 F

Hydrograph



Summary for Subcatchment 3A-5R: Roofs 10-11 B

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 4.56"

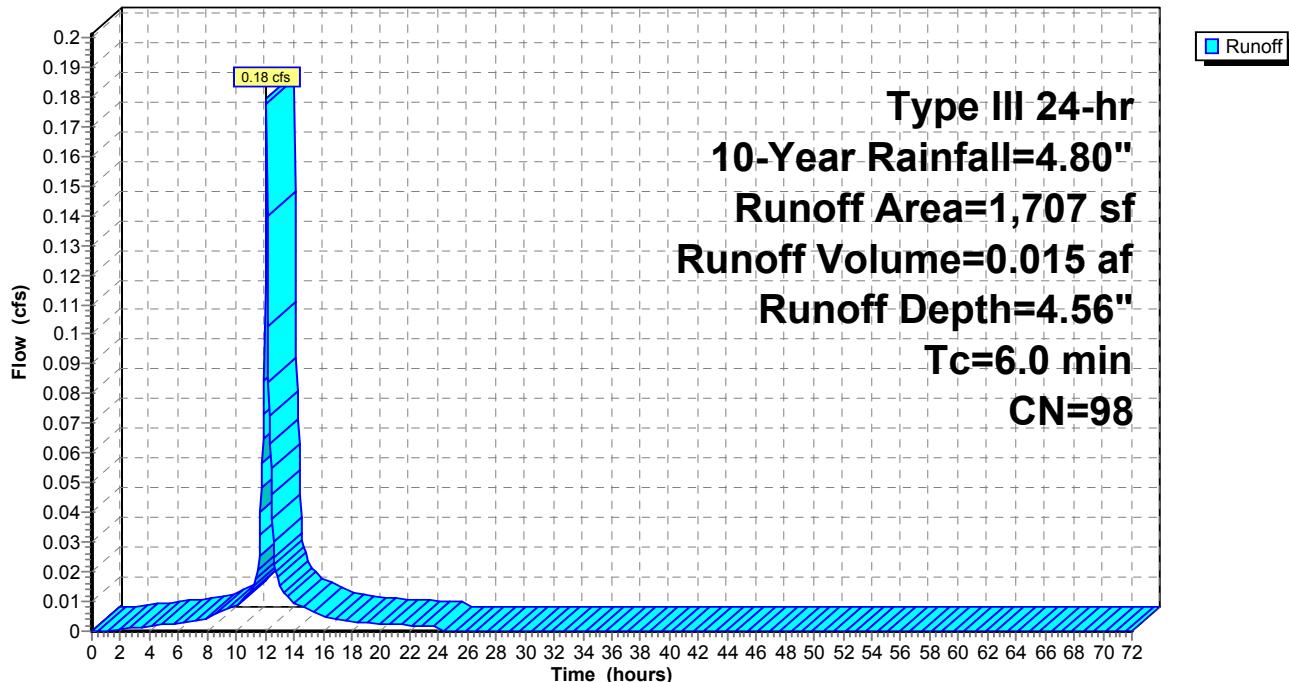
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	1,707	98	Roofs, HSG B
	1,707		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-5R: Roofs 10-11 B

Hydrograph



Summary for Subcatchment 3A-6R: Roofs 12 B

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.007 af, Depth= 4.56"

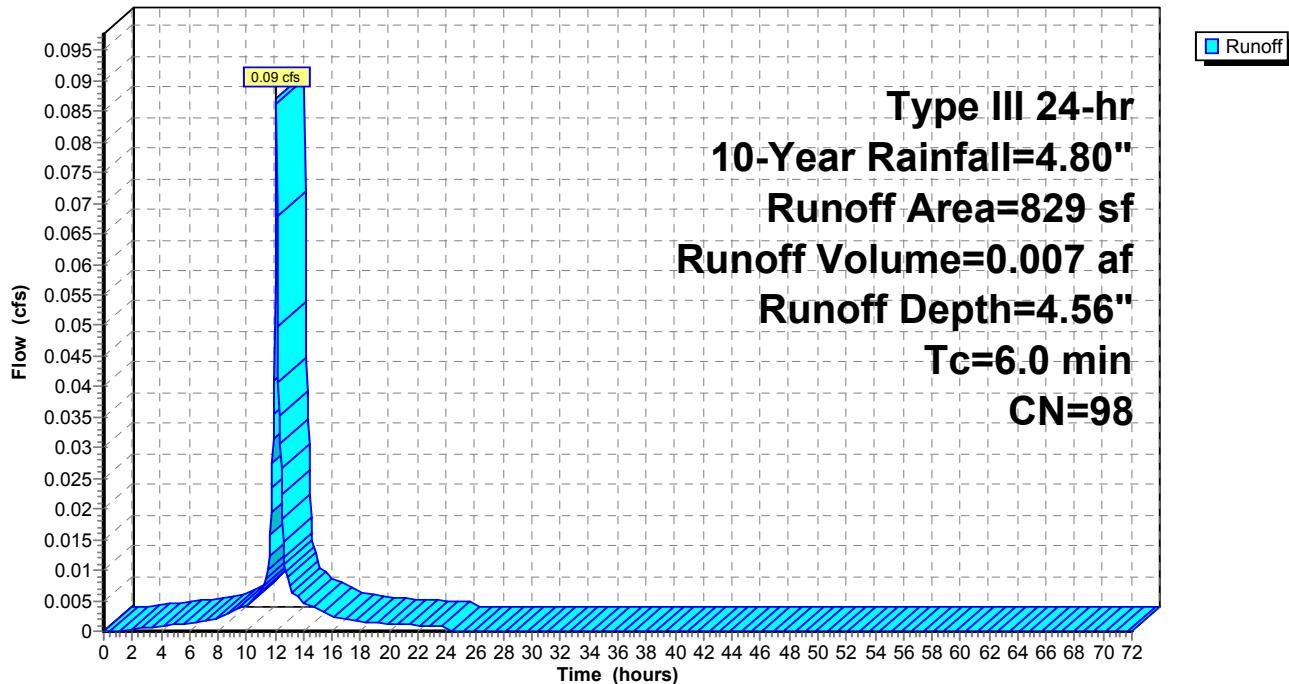
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	829	98	Roofs, HSG B
	829		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-6R: Roofs 12 B

Hydrograph



Summary for Subcatchment 3A-7R: Roofs 12 F

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 4.56"

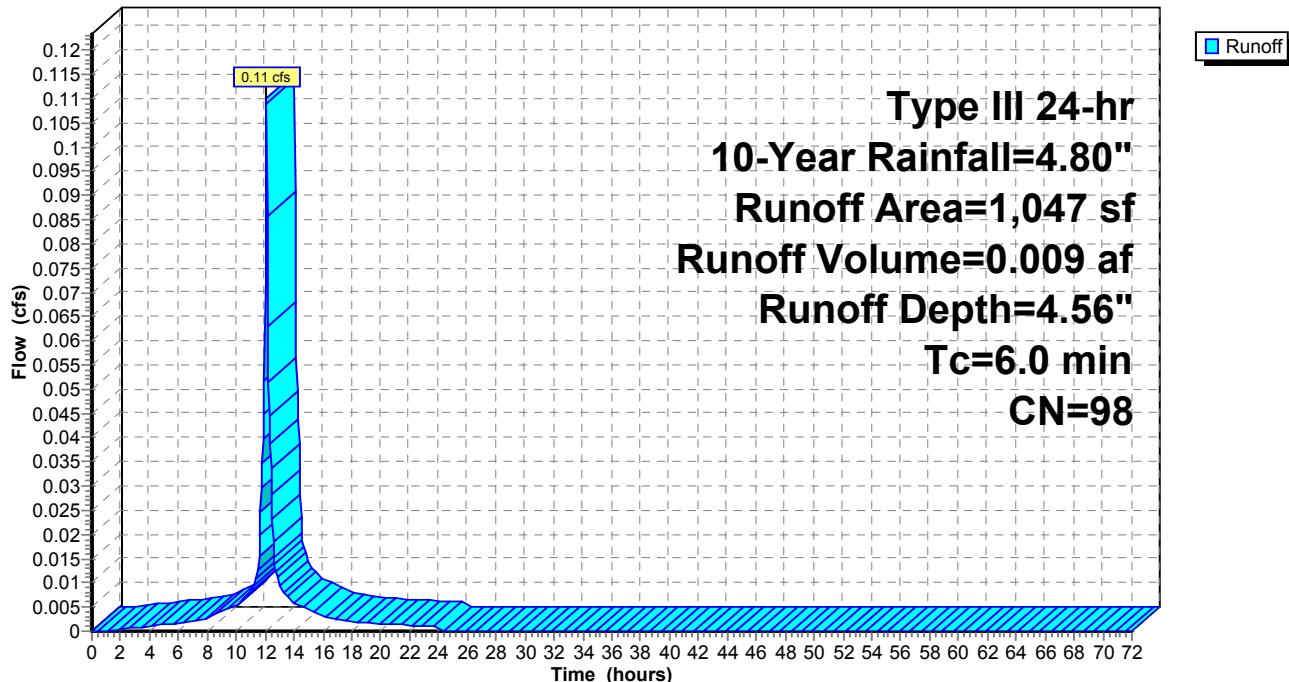
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	1,047	98	Roofs, HSG B
	1,047		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-7R: Roofs 12 F

Hydrograph



Summary for Subcatchment 3A-8R: Roofs 13 F

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 4.56"

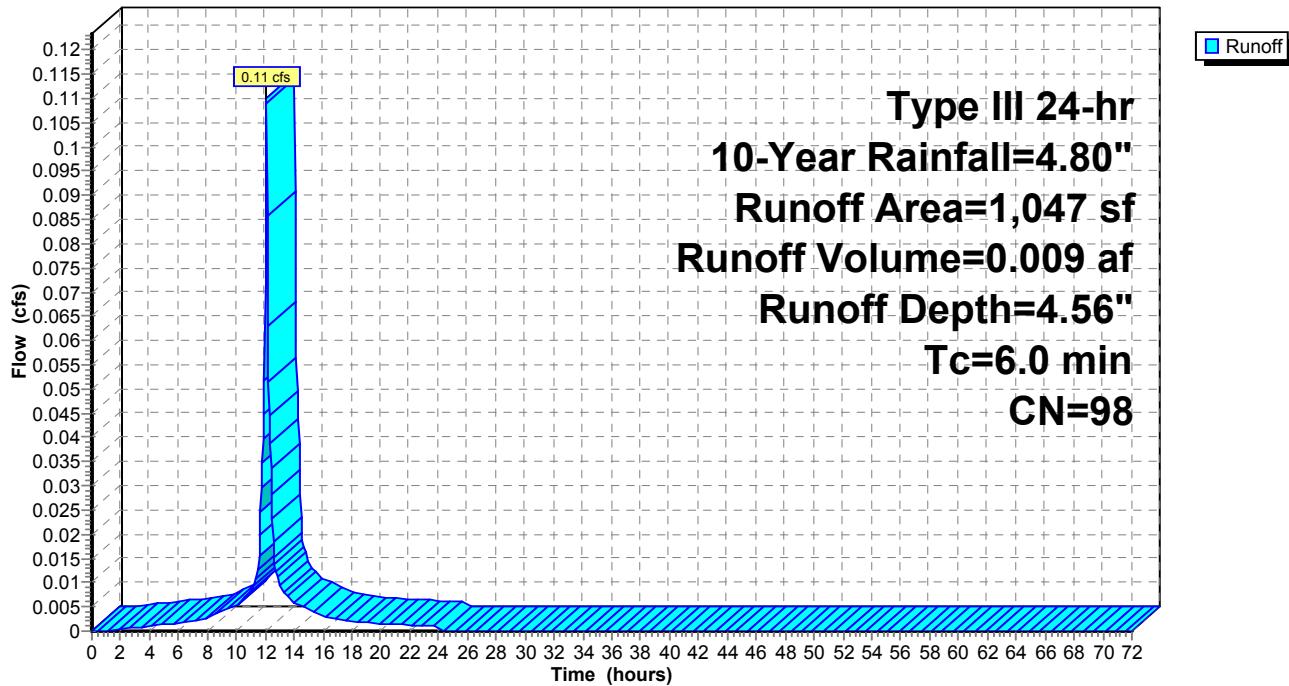
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
80	98	Roofs, HSG A
*	967	Roofs, HSG B
1,047	98	Weighted Average
1,047		100.00% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 3A-8R: Roofs 13 F

Hydrograph



Summary for Subcatchment 3A-9R: Roofs 14 F

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 4.56"

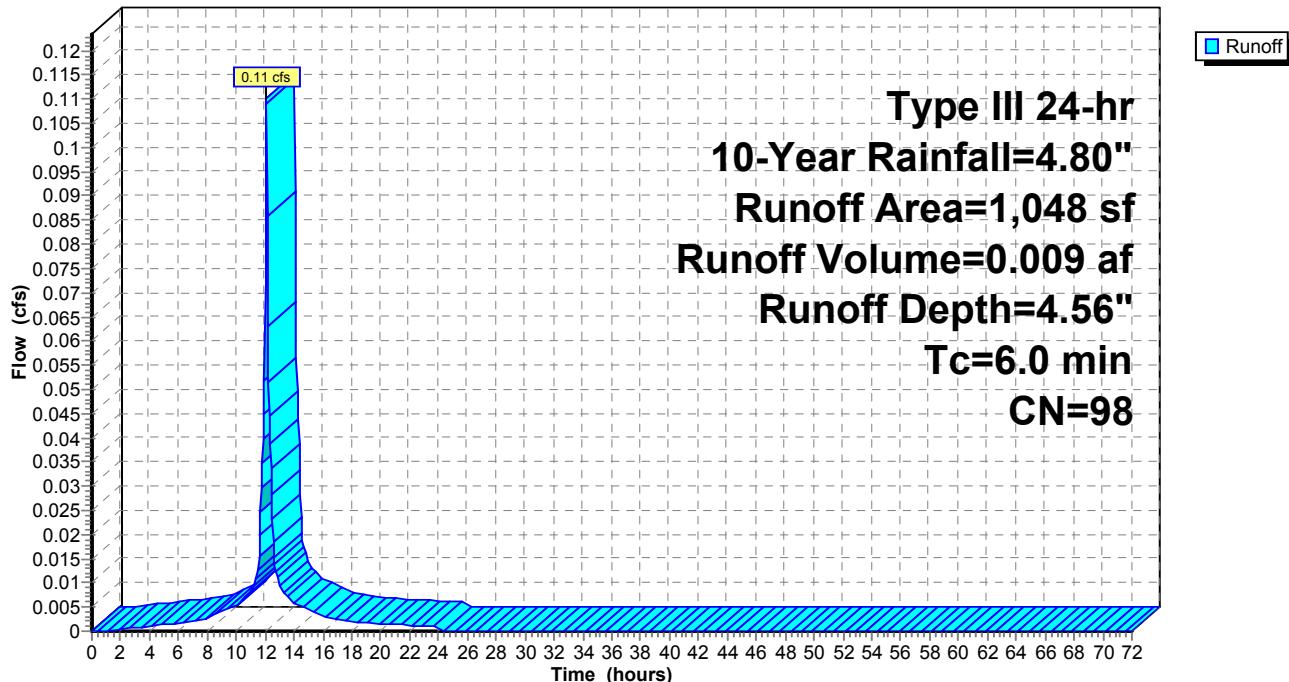
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
1,048	98	Roofs, HSG A
1,048		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-9R: Roofs 14 F

Hydrograph



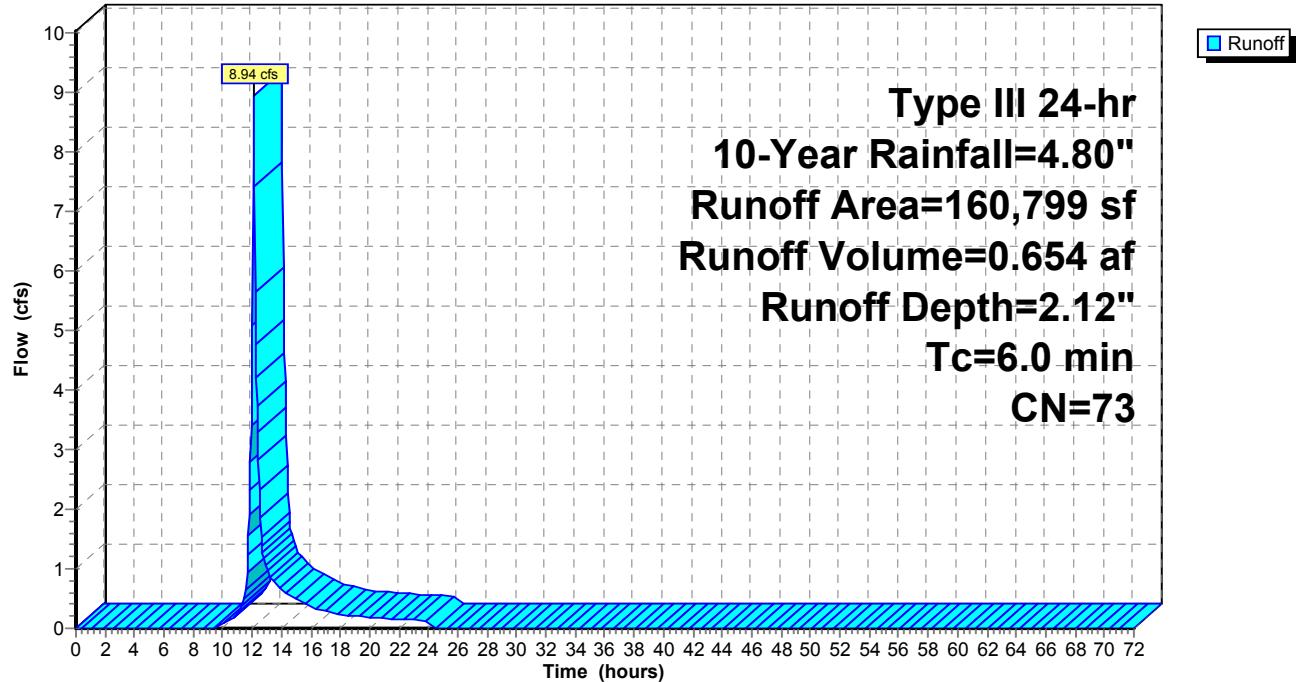
Summary for Subcatchment 3A-S: Sub-3A

Runoff = 8.94 cfs @ 12.10 hrs, Volume= 0.654 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
*	14,912	Paved drives, HSG A
*	2,050	Paved drives, HSG B
*	21,695	Paved roads w/curbs & sewers, HSG A
	8,853	Paved roads w/curbs & sewers, HSG B
*	3,012	Paved sidewalk, HSG A
*	986	Paved sidewalk. HSG B
*	1,189	Walks, HSG A
*	170	Walks, HSG B
*	922	Roofs, HSG A
*	874	Roofs, HSG B
*	2,352	Decks, HSG A
*	77	Decks, HSG B
*	7,626	Detention Basin, HSG A
*	4,140	Detention Basin, HSG B
55,493	39	>75% Grass cover, Good, HSG A
7,411	61	>75% Grass cover, Good, HSG B
2,714	98	Paved roads w/curbs & sewers, HSG A
*	474	Paved sidewalk, HSG A
*	103	Walls, HSG A
2,697	39	>75% Grass cover, Good, HSG A
*	1,384	Roofs, HSG A - offsite
16,069	98	Paved parking, HSG A - offsite
*	914	>75% Grass cover, Good, HSG A - offsite
*	1,682	Woods, Good, HSG A - offsite
*	3,000	Woods, Good, HSG A - offsite
160,799	73	Weighted Average
71,197		44.28% Pervious Area
89,602		55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 3A-S: Sub-3A**Hydrograph**

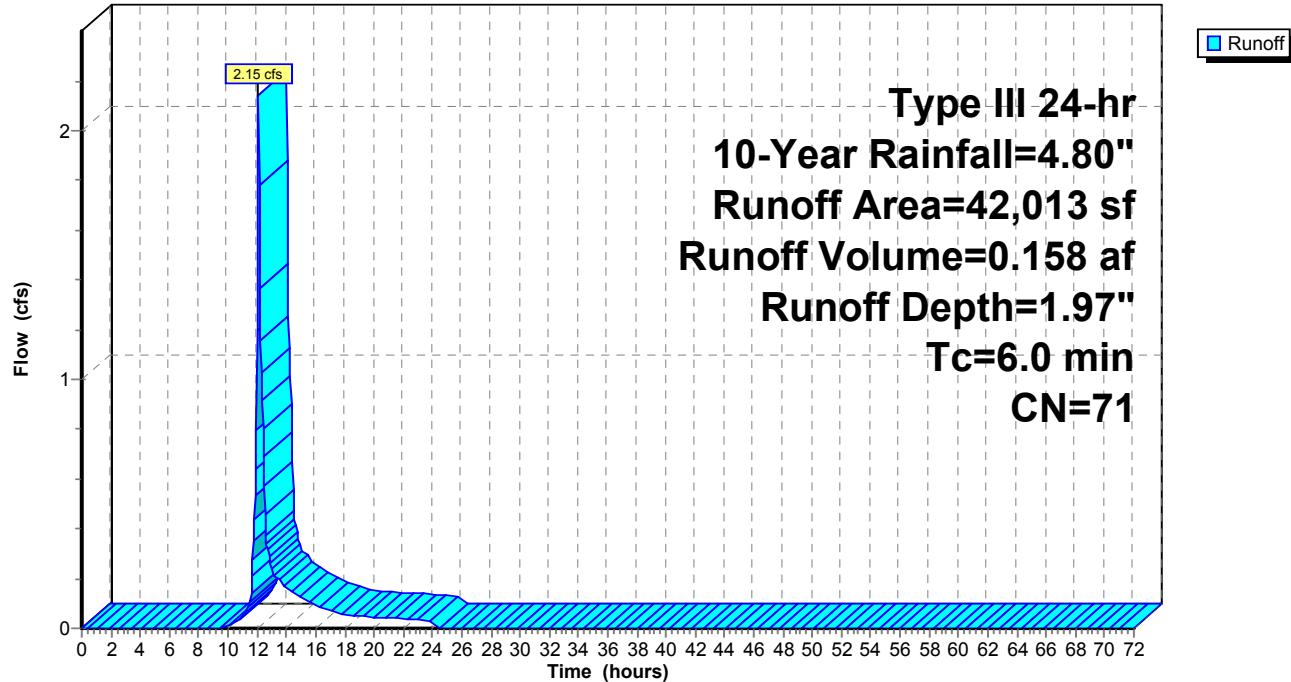
Summary for Subcatchment 3B-S: Sub-3B

Runoff = 2.15 cfs @ 12.10 hrs, Volume= 0.158 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
10,864	55	Woods, Good, HSG B
1,423	30	Woods, Good, HSG A
*	15,816	Wetlands, HSG B
1,532	39	>75% Grass cover, Good, HSG A
7,195	61	>75% Grass cover, Good, HSG B
*	0	Roofs, HSG B
*	666	Decks, HSG B
*	418	Wetlands, HSG B - offsite
*	62	Woods, Good, HSG A - offsite
*	1,346	>75% Grass cover, Good, HSG A - offsite
*	957	>75% Grass cover, Good, HSG B - offsite
*	1,734	Woods, Good, HSG B - offsite
42,013	71	Weighted Average
25,113		59.77% Pervious Area
16,900		40.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 3B-S: Sub-3B**Hydrograph**

Summary for Subcatchment 3C-S: Sub-3C

Runoff = 0.32 cfs @ 12.11 hrs, Volume= 0.029 af, Depth= 0.94"

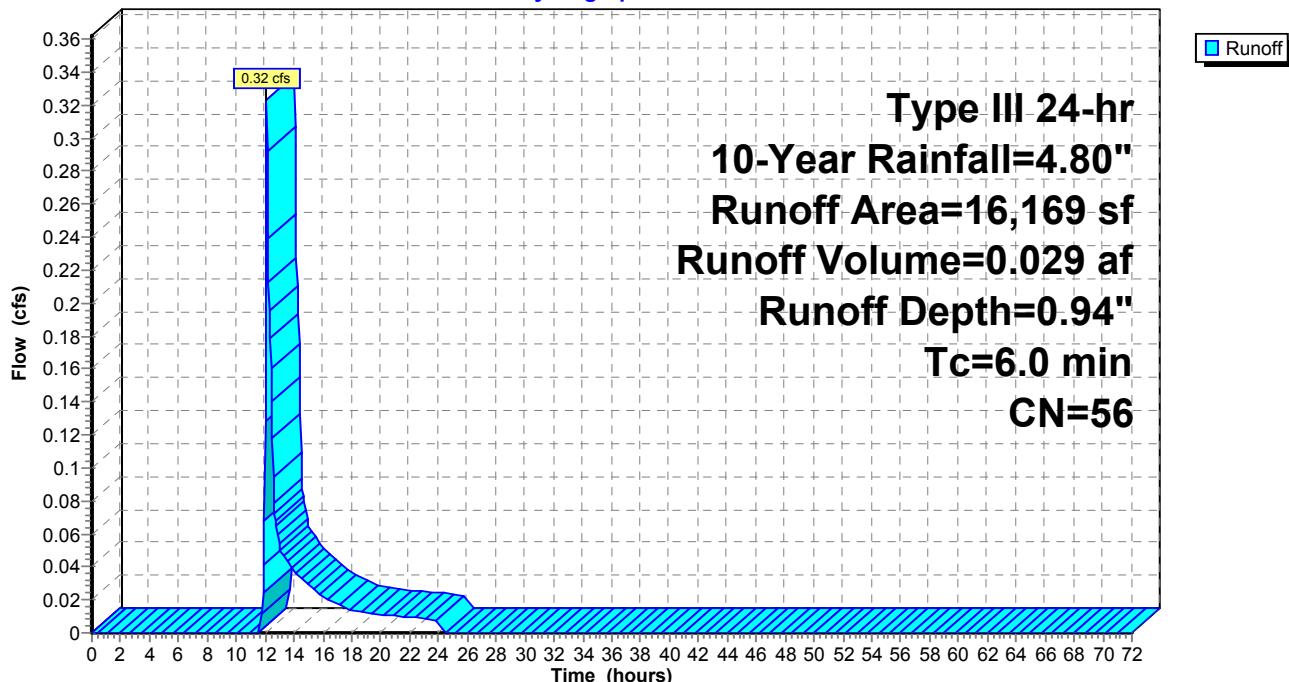
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

	Area (sf)	CN	Description
*	2,133	30	Woods, Good, HSG A - offsite
*	714	98	Paved roads w/curbs & sewers, HSG A - offsite
*	290	98	Paved drives, HSG A - offsite
*	2,061	39	>75% Grass cover, Good, HSG A - offsite
	4,666	61	>75% Grass cover, Good, HSG B
	4,041	39	>75% Grass cover, Good, HSG A
*	234	98	Paved sidewalk, HSG B
*	77	98	Paved sidewalk, HSG A
	1,600	98	Paved roads w/curbs & sewers, HSG B
*	75	98	Decks, HSG B
	278	98	Paved roads w/curbs & sewers, HSG A
	16,169	56	Weighted Average
	12,901		79.79% Pervious Area
	3,268		20.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 3C-S: Sub-3C

Hydrograph



Summary for Subcatchment 4S-1: Sub-4

Runoff = 0.35 cfs @ 12.10 hrs, Volume= 0.028 af, Depth= 1.25"

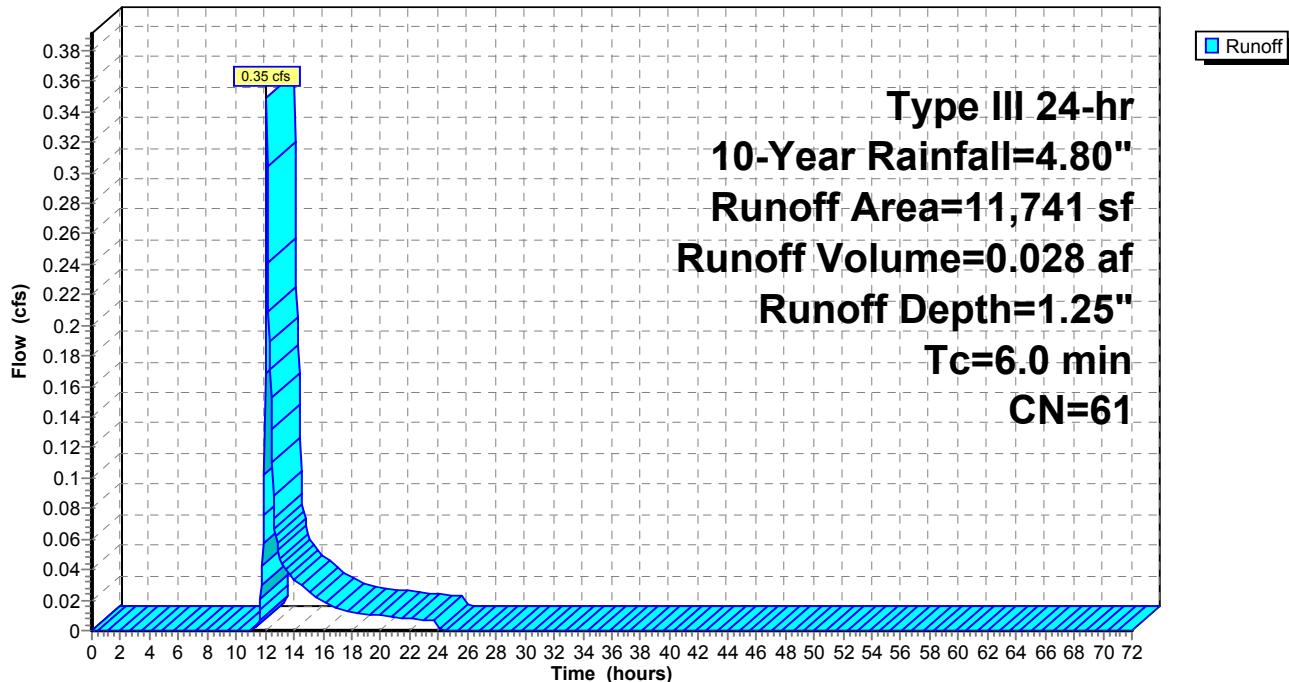
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
6,586	39	>75% Grass cover, Good, HSG A
* 942	98	Decks, HSG A
3,456	98	Roofs, HSG A
757	39	>75% Grass cover, Good, HSG A
11,741	61	Weighted Average
7,343		62.54% Pervious Area
4,398		37.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 4S-1: Sub-4

Hydrograph



Summary for Subcatchment 4S-1R: Roofs 22-24 B

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 0.023 af, Depth= 4.56"

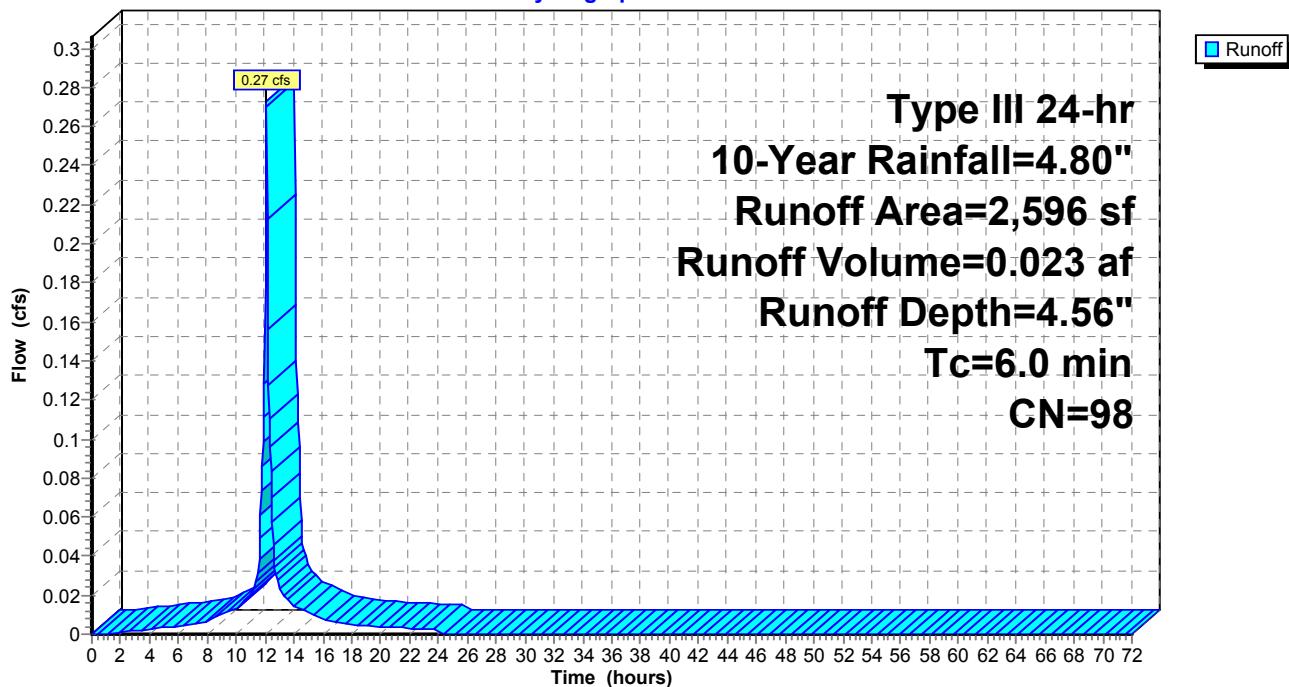
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
2,596	98	Roofs, HSG A
2,596		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 4S-1R: Roofs 22-24 B

Hydrograph



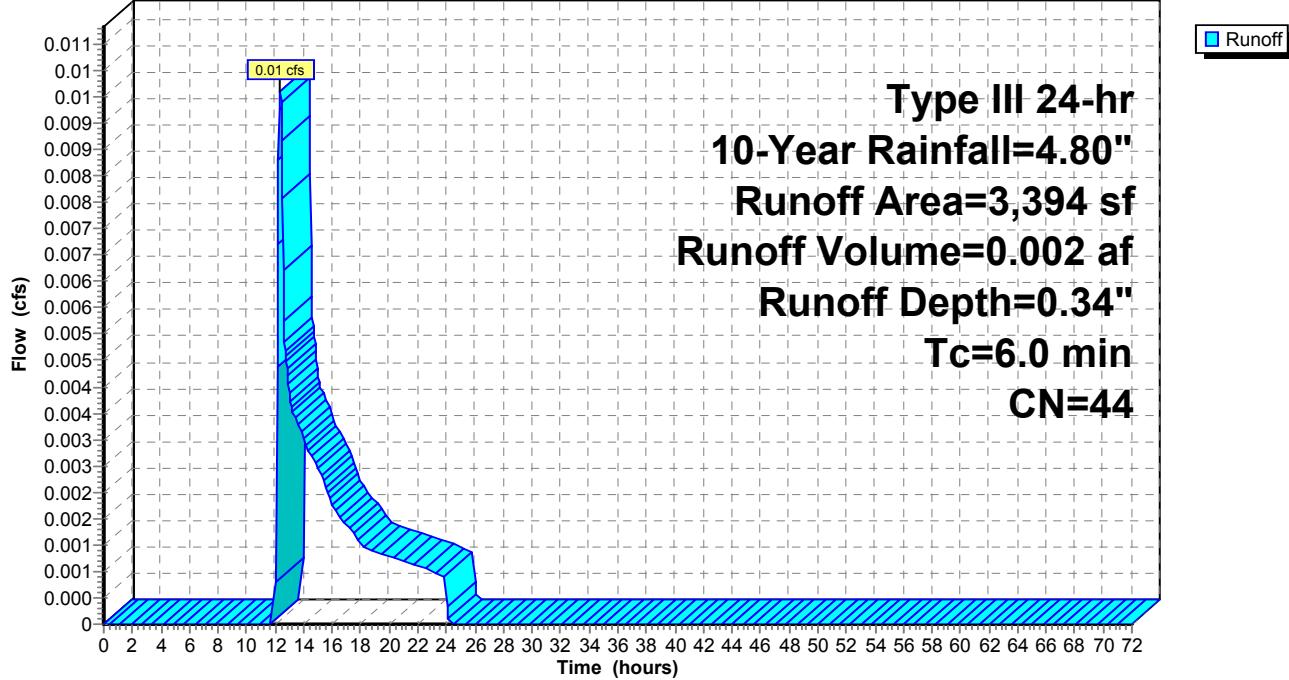
Summary for Subcatchment 4S-2: Sub-4

Runoff = 0.01 cfs @ 12.36 hrs, Volume= 0.002 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Subcatchment 4S-2: Sub-4

Hydrograph



Summary for Subcatchment 5S: Sub -5

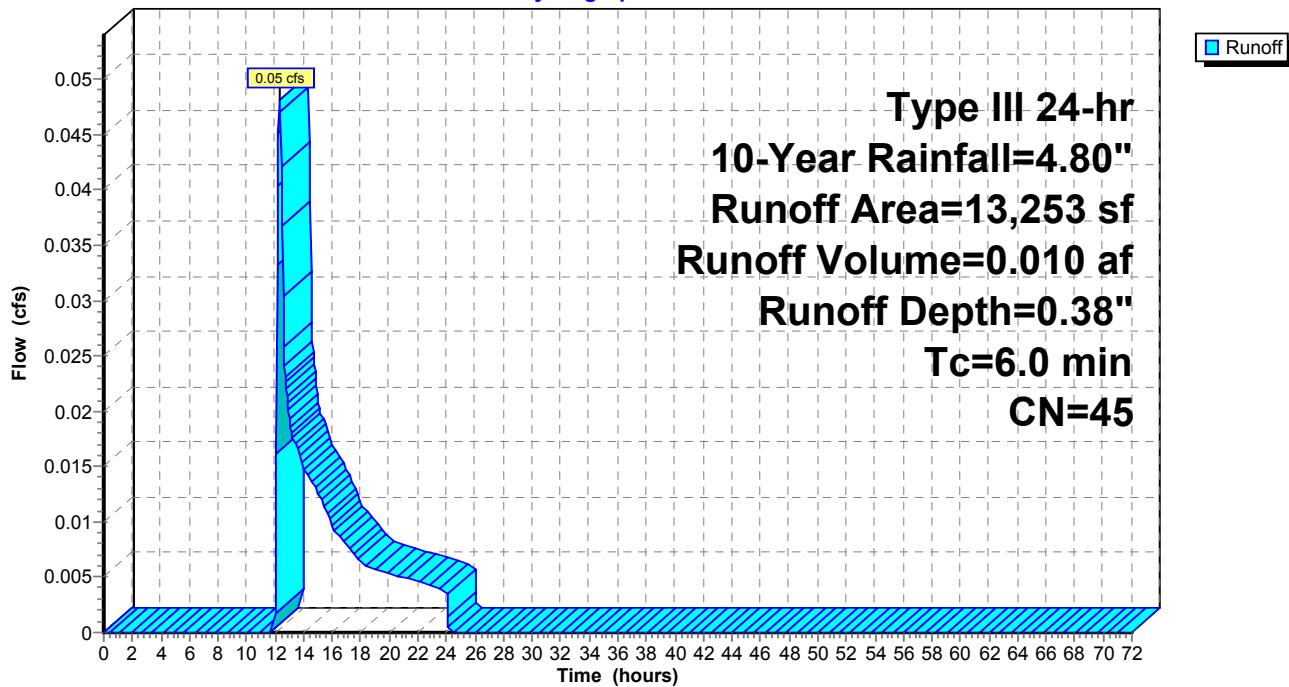
Runoff = 0.05 cfs @ 12.33 hrs, Volume= 0.010 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description		
11,396	39	>75% Grass cover, Good, HSG A		
*	634	>75% Grass cover, Good, HSG D		
*	14	Decks, HSG D		
*	1,112	Decks, HSG A		
*	40	Walls, HSG D		
*	57	Walls, HSG A		
13,253	45	Weighted Average		
12,030		90.77% Pervious Area		
1,223		9.23% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description		
6.0				Direct Entry,

Subcatchment 5S: Sub -5

Hydrograph



Summary for Subcatchment 5S-1R: Roofs 18-21 B

Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.030 af, Depth= 4.56"

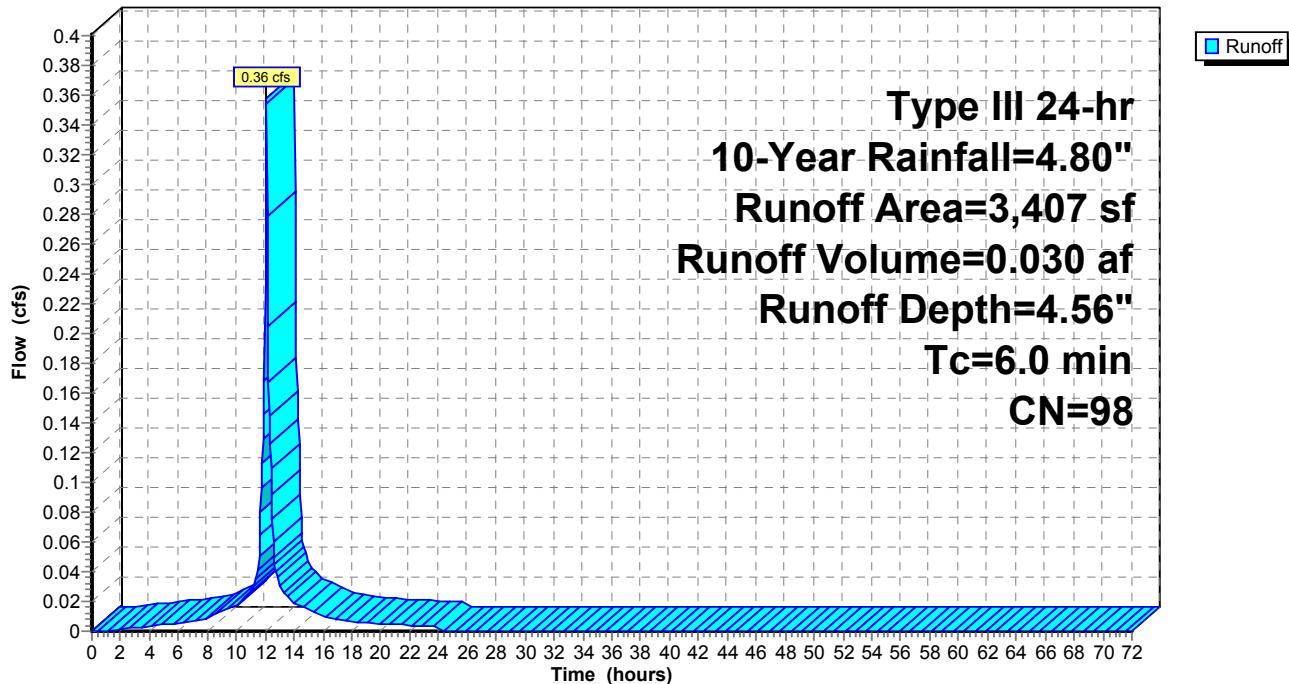
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.80"

Area (sf)	CN	Description
3,407	98	Roofs, HSG A
3,407		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 5S-1R: Roofs 18-21 B

Hydrograph



Summary for Reach DP-1: DMH

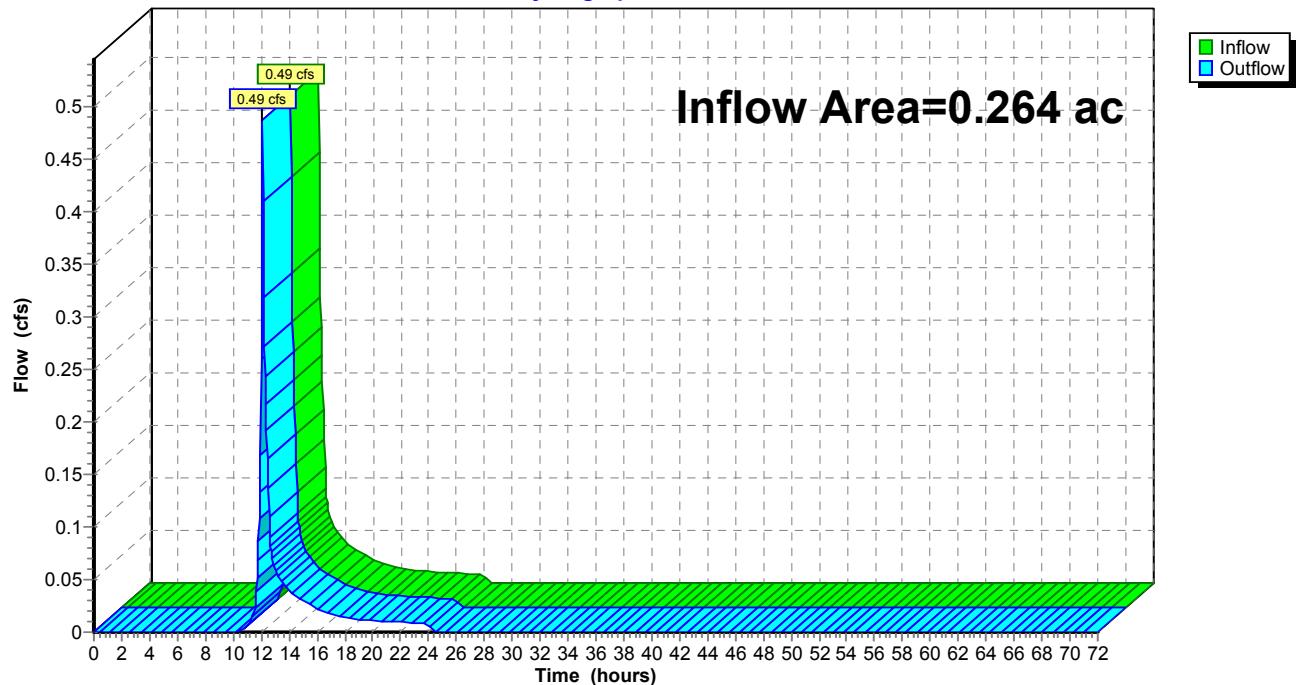
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.264 ac, 47.75% Impervious, Inflow Depth = 1.67" for 10-Year event
 Inflow = 0.49 cfs @ 12.10 hrs, Volume= 0.037 af
 Outflow = 0.49 cfs @ 12.10 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-1: DMH

Hydrograph



Summary for Reach DP-2: DP-2

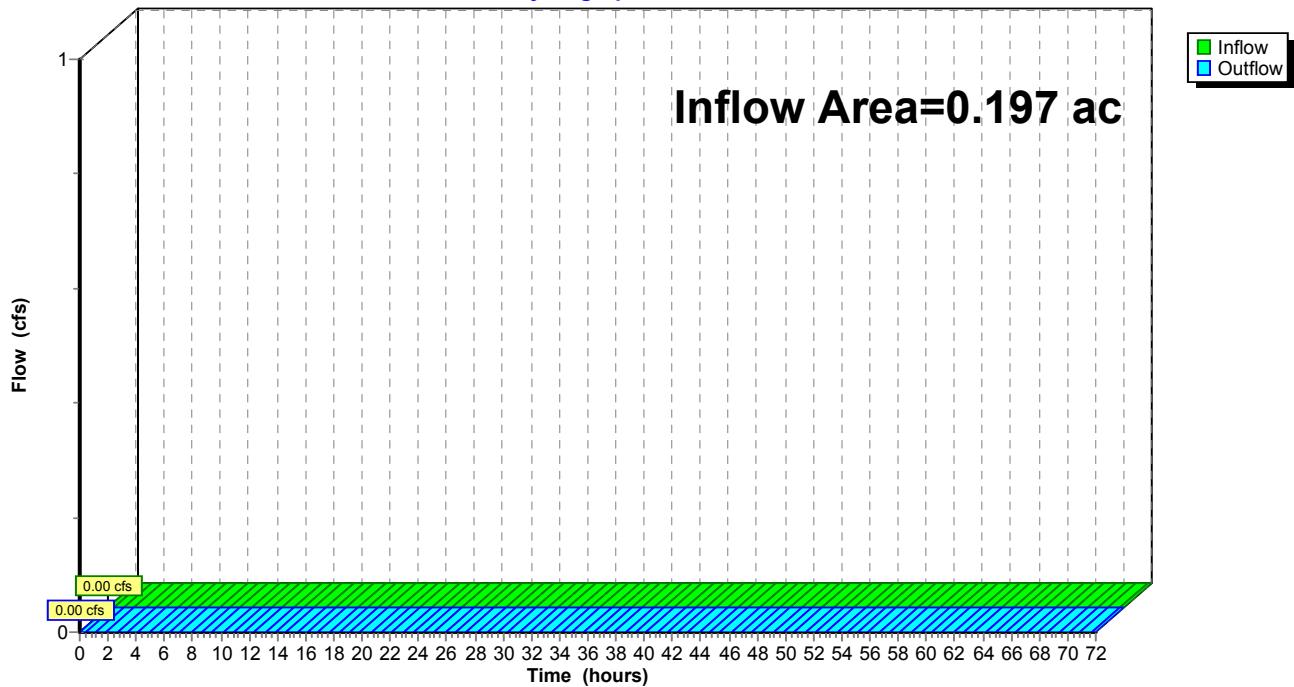
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.197 ac, 7.82% Impervious, Inflow Depth = 0.00" for 10-Year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-2: DP-2

Hydrograph



Summary for Reach DP-3: DP-3

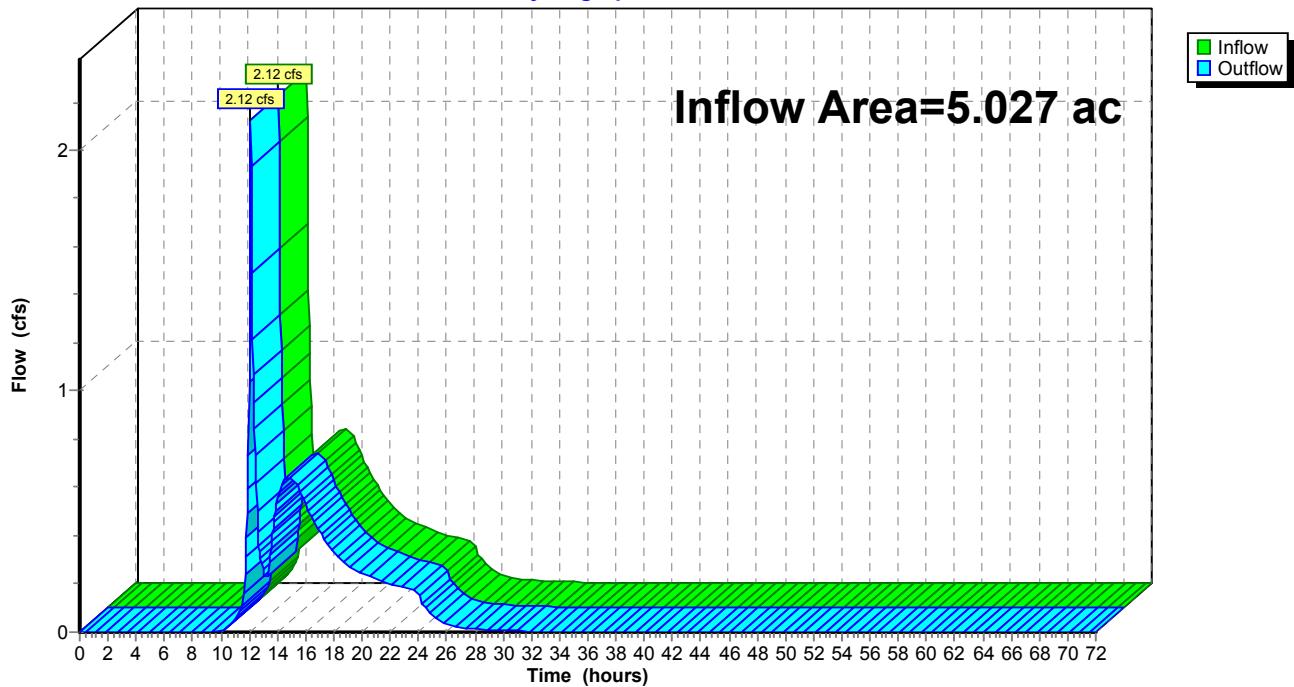
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.027 ac, 50.13% Impervious, Inflow Depth = 1.00" for 10-Year event
 Inflow = 2.12 cfs @ 12.11 hrs, Volume= 0.419 af
 Outflow = 2.12 cfs @ 12.11 hrs, Volume= 0.419 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-3: DP-3

Hydrograph



Summary for Reach DP-4: PL

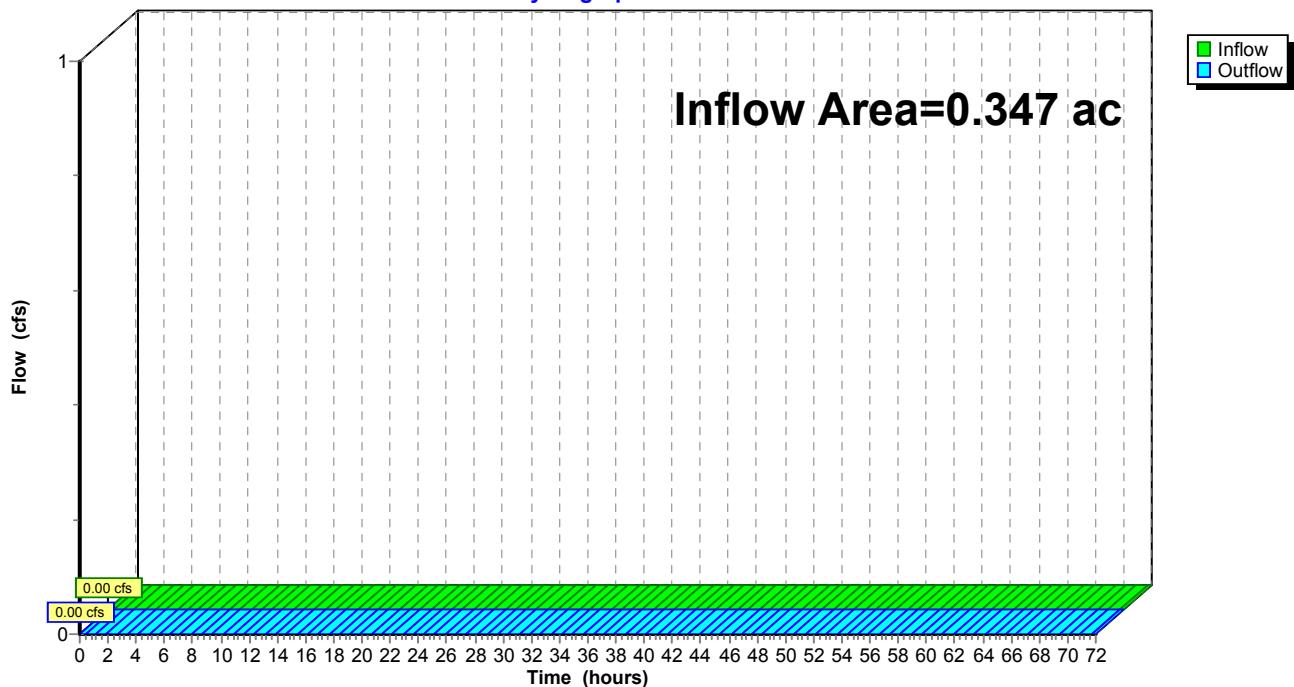
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.347 ac, 31.11% Impervious, Inflow Depth = 0.00" for 10-Year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-4: PL

Hydrograph



Summary for Reach DP-5: PL

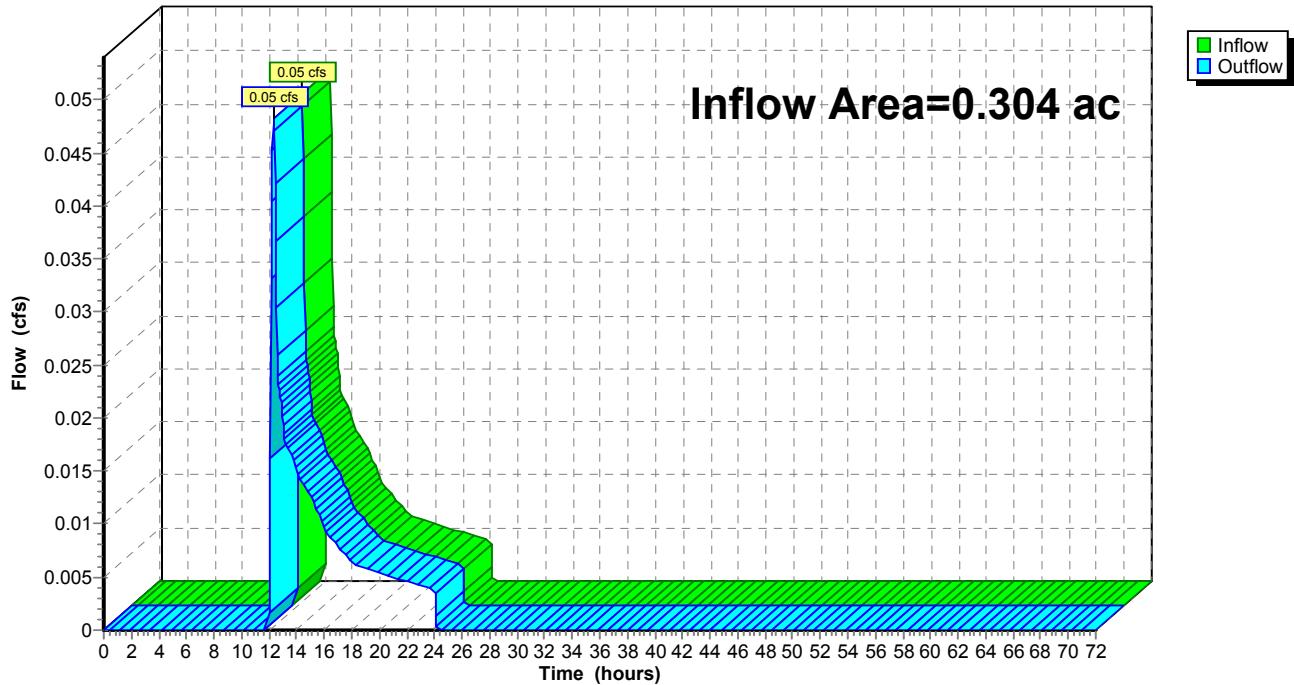
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.304 ac, 9.23% Impervious, Inflow Depth = 0.38" for 10-Year event
 Inflow = 0.05 cfs @ 12.33 hrs, Volume= 0.010 af
 Outflow = 0.05 cfs @ 12.33 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-5: PL

Hydrograph



Summary for Pond D-1: Depression

Inflow Area = 0.197 ac, 7.82% Impervious, Inflow Depth = 0.34" for 10-Year event
 Inflow = 0.03 cfs @ 12.36 hrs, Volume= 0.006 af
 Outflow = 0.03 cfs @ 12.37 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.9 min
 Discarded = 0.03 cfs @ 12.37 hrs, Volume= 0.006 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

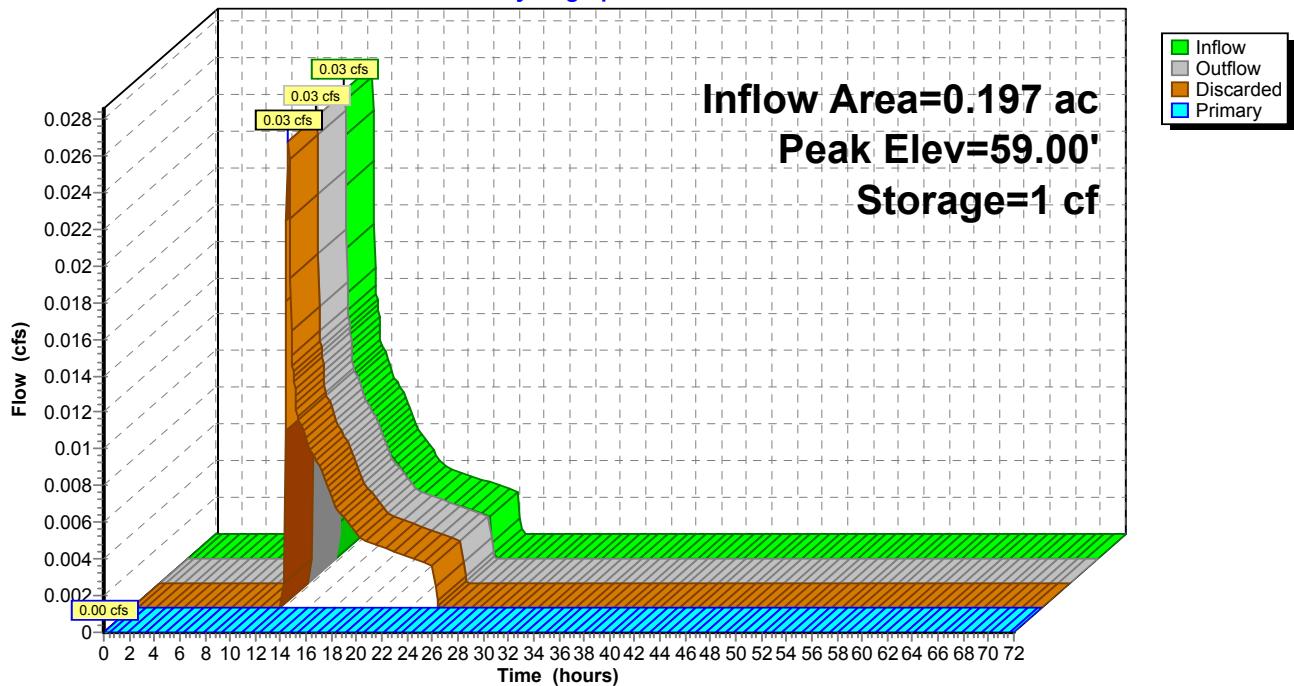
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.00' @ 12.37 hrs Surf.Area= 420 sf Storage= 1 cf

Plug-Flow detention time= 0.9 min calculated for 0.006 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (964.2 - 963.4)

Volume	Invert	Avail.Storage	Storage Description	
#1	59.00'	615 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
59.00	419	0	0	
60.00	811	615	615	
Device	Routing	Invert	Outlet Devices	
#1	Discarded	59.00'	8.270 in/hr Exfiltration over Surface area	Phase-In= 0.01'
#2	Primary	60.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir	
			Head (feet)	0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
				2.50 3.00 3.50 4.00 4.50
			Coef. (English)	2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
				2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.03 cfs @ 12.37 hrs HW=59.00' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' TW=0.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond D-1: Depression**Hydrograph**

Summary for Pond D-2: Depression

Inflow Area = 0.371 ac, 20.21% Impervious, Inflow Depth = 0.94" for 10-Year event
 Inflow = 0.32 cfs @ 12.11 hrs, Volume= 0.029 af
 Outflow = 0.15 cfs @ 12.42 hrs, Volume= 0.029 af, Atten= 54%, Lag= 18.8 min
 Discarded = 0.15 cfs @ 12.42 hrs, Volume= 0.029 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

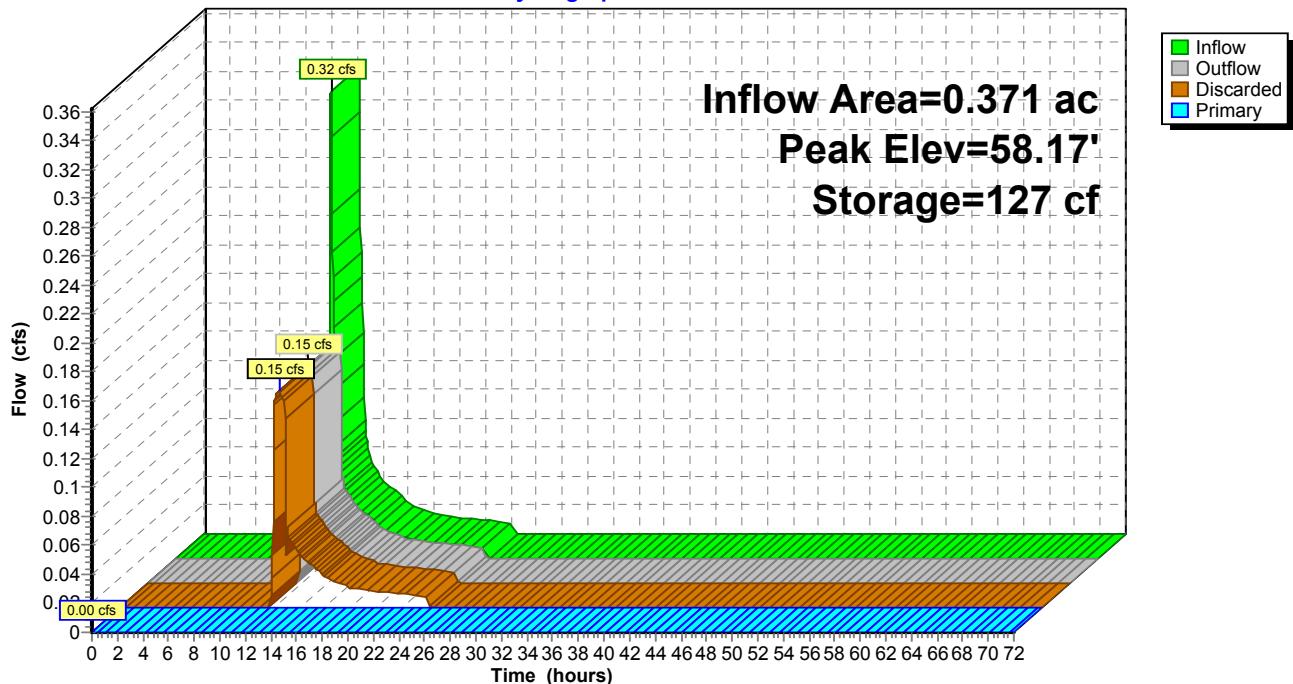
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 58.17' @ 12.42 hrs Surf.Area= 784 sf Storage= 127 cf

Plug-Flow detention time= 4.1 min calculated for 0.029 af (100% of inflow)
 Center-of-Mass det. time= 4.1 min (896.8 - 892.7)

Volume	Invert	Avail.Storage	Storage Description	
#1	58.00'	899 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
58.00	726	0	0	
59.00	1,071	899	899	
Device	Routing	Invert	Outlet Devices	
#1	Discarded	58.00'	8.270 in/hr Exfiltration over Surface area	Phase-In= 0.01'
#2	Primary	59.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir	
			Head (feet)	0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
				2.50 3.00 3.50 4.00 4.50
			Coef. (English)	2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
				2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.15 cfs @ 12.42 hrs HW=58.17' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' TW=56.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond D-2: Depression**Hydrograph**

Summary for Pond D-3: Depression

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=14)

Inflow Area = 0.270 ac, 37.46% Impervious, Inflow Depth = 1.25" for 10-Year event
 Inflow = 0.35 cfs @ 12.10 hrs, Volume= 0.028 af
 Outflow = 0.03 cfs @ 11.95 hrs, Volume= 0.028 af, Atten= 91%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.95 hrs, Volume= 0.028 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 63.52' @ 14.38 hrs Surf.Area= 1,075 sf Storage= 477 cf

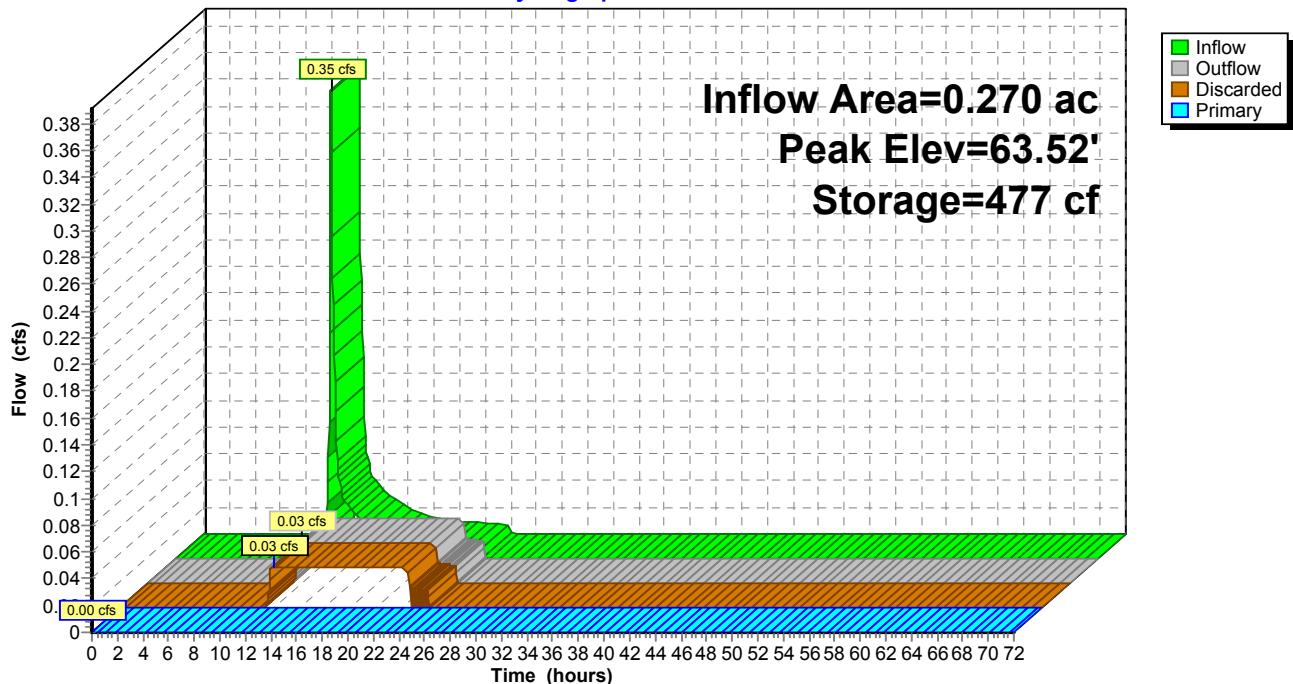
Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 163.6 min (1,038.9 - 875.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	63.00'	2,747 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
63.00	757	0	0	
64.00	1,368	1,063	1,063	
65.00	2,001	1,685	2,747	

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	0.03 cfs Exfiltration when above 63.00'
#2	Primary	65.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.03 cfs @ 11.95 hrs HW=63.03' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=63.00' TW=0.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond D-3: Depression**Hydrograph**

Summary for Pond D-4: Depression

Inflow Area = 0.078 ac, 9.16% Impervious, Inflow Depth = 0.34" for 10-Year event
 Inflow = 0.01 cfs @ 12.36 hrs, Volume= 0.002 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

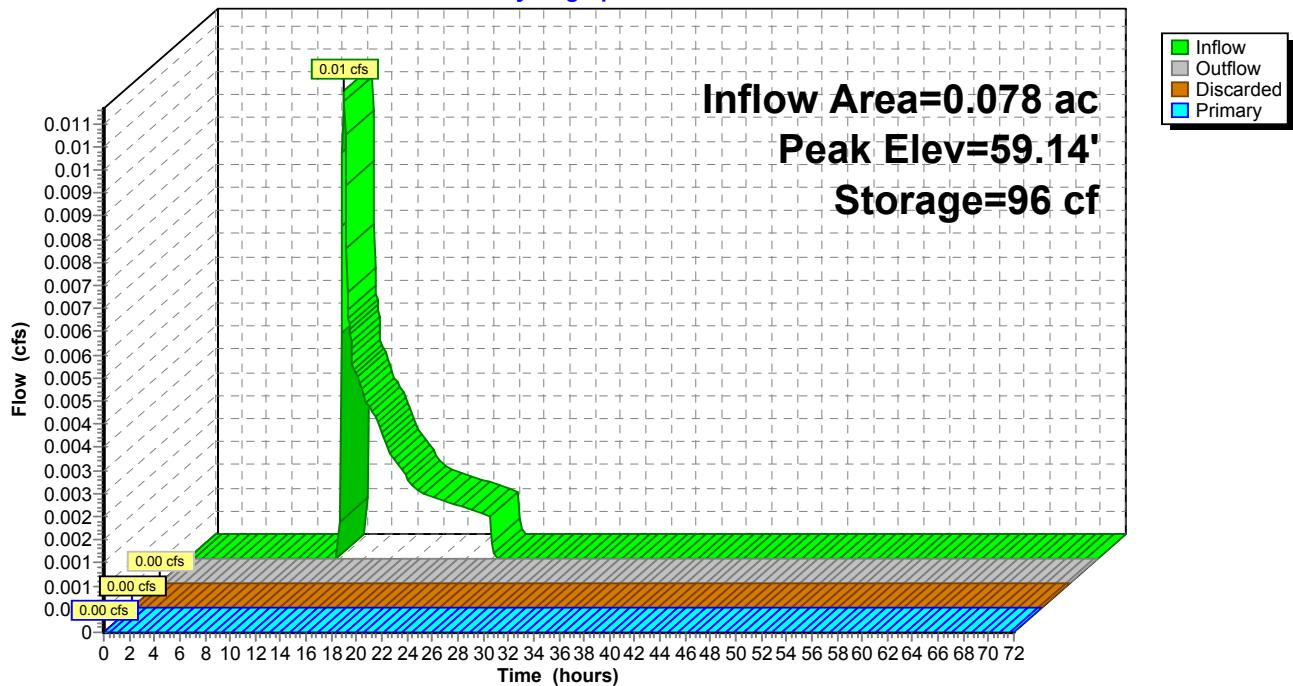
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.14' @ 24.40 hrs Surf.Area= 713 sf Storage= 96 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description	
#1	59.00'	938 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
59.00	622	0	0	
60.00	1,254	938	938	
Device	Routing	Invert	Outlet Devices	
#1	Discarded	63.00'	0.03 cfs Exfiltration when above 63.00'	
#2	Primary	65.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32	

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' (Free Discharge)
 ↑ 1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' TW=0.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond D-4: Depression**Hydrograph**

Summary for Pond DB-1: Prop Detention Basin

Inflow Area = 3.691 ac, 55.72% Impervious, Inflow Depth = 2.12" for 10-Year event
 Inflow = 8.94 cfs @ 12.10 hrs, Volume= 0.654 af
 Outflow = 0.52 cfs @ 14.88 hrs, Volume= 0.261 af, Atten= 94%, Lag= 166.8 min
 Primary = 0.52 cfs @ 14.88 hrs, Volume= 0.261 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.38' @ 14.88 hrs Surf.Area= 10,171 sf Storage= 18,965 cf

Plug-Flow detention time= 374.1 min calculated for 0.260 af (40% of inflow)
 Center-of-Mass det. time= 248.2 min (1,090.3 - 842.1)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	25,568 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	5,474	0	0
59.00	7,714	6,594	6,594
60.00	9,473	8,594	15,188
61.00	11,288	10,381	25,568

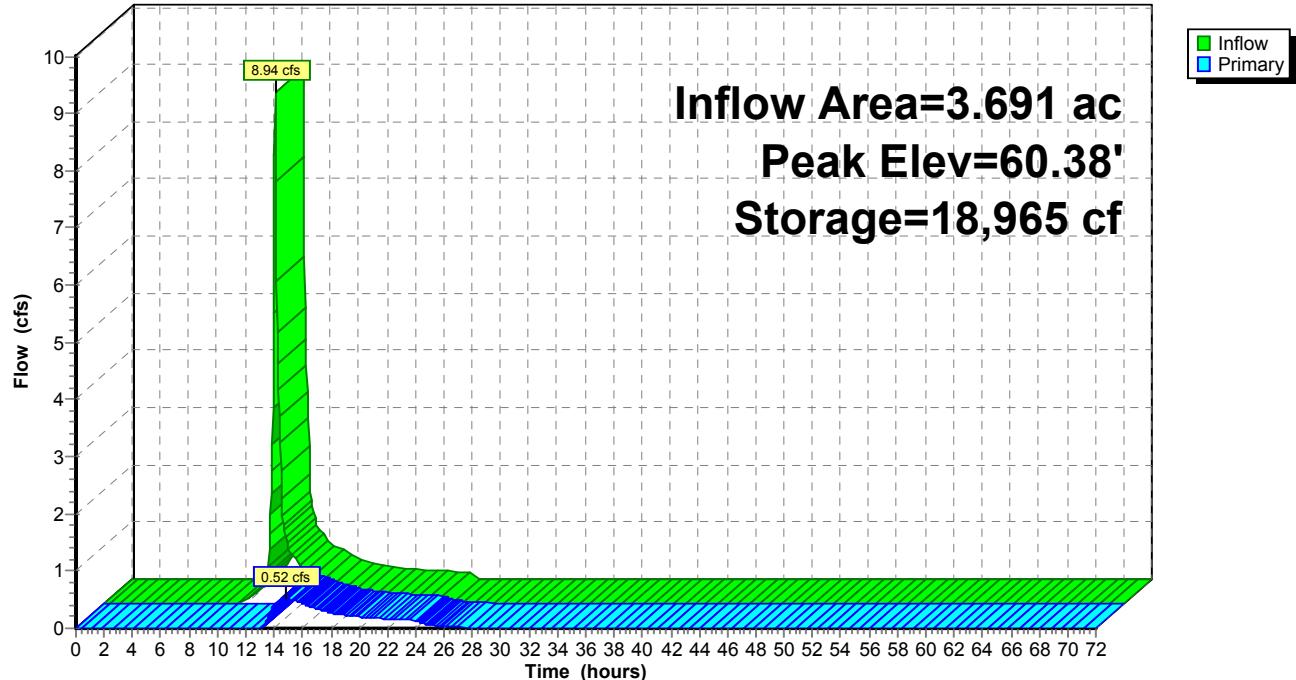
Device	Routing	Invert	Outlet Devices
#1	Primary	58.20'	10.0" Round Culvert L= 25.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 58.20' / 58.05' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 0.55 sf
#2	Device 1	60.20'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.6' Crest Height
#3	Device 1	61.50'	7.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s) 2.4' Crest Height

Primary OutFlow Max=0.52 cfs @ 14.88 hrs HW=60.38' TW=56.02' (Dynamic Tailwater)

↑ 1=Culvert (Passes 0.52 cfs of 3.39 cfs potential flow)

 └─ 2=Sharp-Crested Rectangular Weir(Weir Controls 0.52 cfs @ 1.42 fps)

 └─ 3=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond DB-1: Prop Detention Basin**Hydrograph**

Summary for Pond P1: Infiltration Chambers

Inflow Area = 0.044 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af
 Outflow = 0.04 cfs @ 11.75 hrs, Volume= 0.017 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.75 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.60' @ 12.52 hrs Surf.Area= 199 sf Storage= 172 cf

Plug-Flow detention time= 23.0 min calculated for 0.017 af (100% of inflow)
 Center-of-Mass det. time= 23.0 min (771.7 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	195 cf	6.33'W x 31.50'L x 3.54'H Field A 707 cf Overall - 220 cf Embedded = 487 cf x 40.0% Voids
#2A	56.70'	220 cf	Cultec R-330XLHD x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.200 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.75 hrs HW=56.25' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P1: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

4 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 29.50' Row Length +12.0" End Stone x 2 = 31.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

4 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 219.8 cf Chamber Storage

706.6 cf Field - 219.8 cf Chambers = 486.8 cf Stone x 40.0% Voids = 194.7 cf Stone Storage

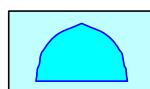
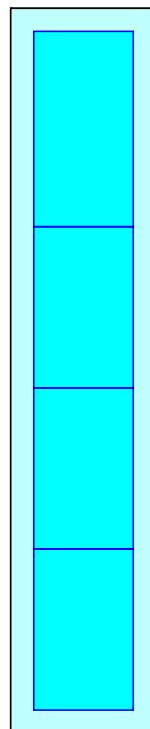
Chamber Storage + Stone Storage = 414.5 cf = 0.010 af

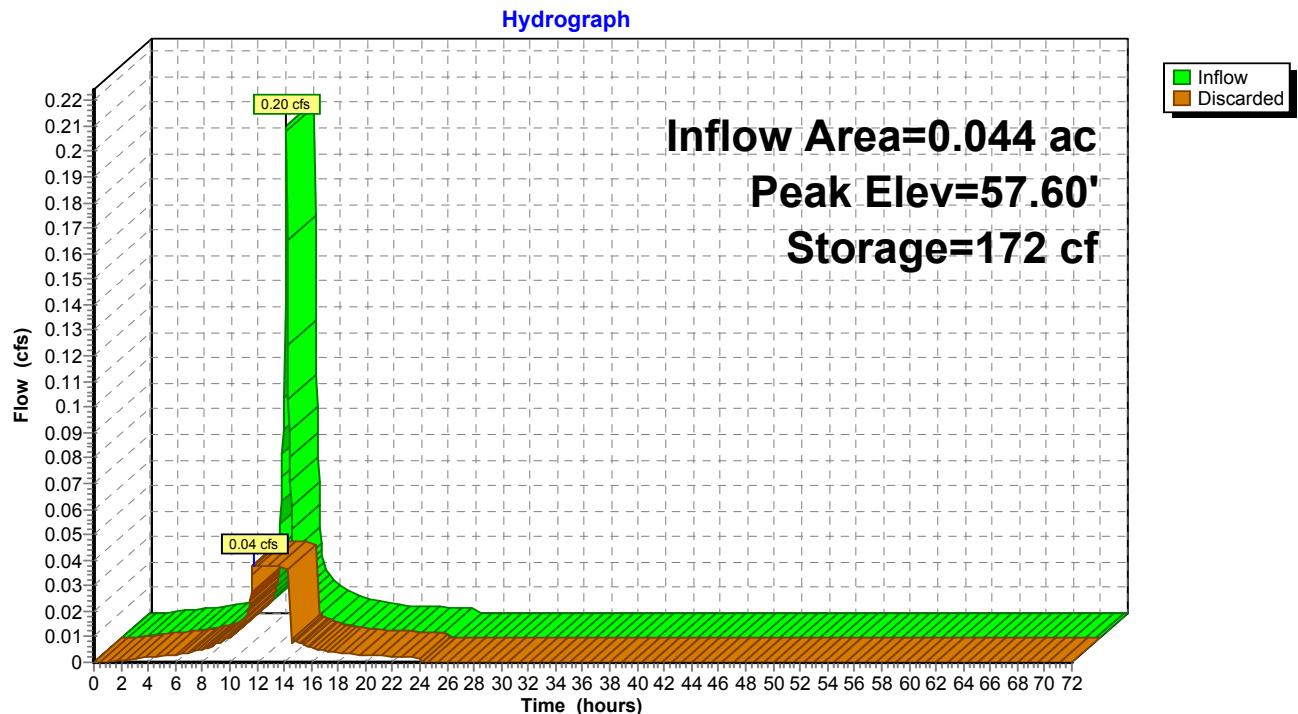
Overall Storage Efficiency = 58.7%

4 Chambers

26.2 cy Field

18.0 cy Stone



Pond P1: Infiltration Chambers

Summary for Pond P10: Infiltration Chambers

Inflow Area = 0.044 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af
 Outflow = 0.04 cfs @ 11.75 hrs, Volume= 0.017 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.75 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.99' @ 12.52 hrs Surf.Area= 199 sf Storage= 171 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 22.6 min (771.3 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	195 cf	6.33'W x 31.50'L x 3.54'H Field A 707 cf Overall - 220 cf Embedded = 487 cf x 40.0% Voids
#2A	60.10'	220 cf	Cultec R-330XLHD x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.75 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P10: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

4 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 29.50' Row Length +12.0" End Stone x 2 = 31.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

4 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 219.8 cf Chamber Storage

706.6 cf Field - 219.8 cf Chambers = 486.8 cf Stone x 40.0% Voids = 194.7 cf Stone Storage

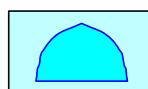
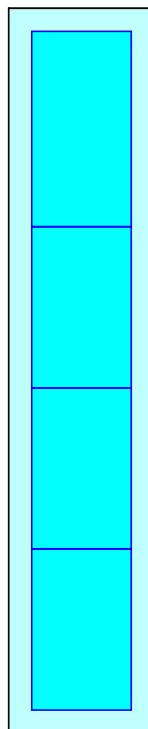
Chamber Storage + Stone Storage = 414.5 cf = 0.010 af

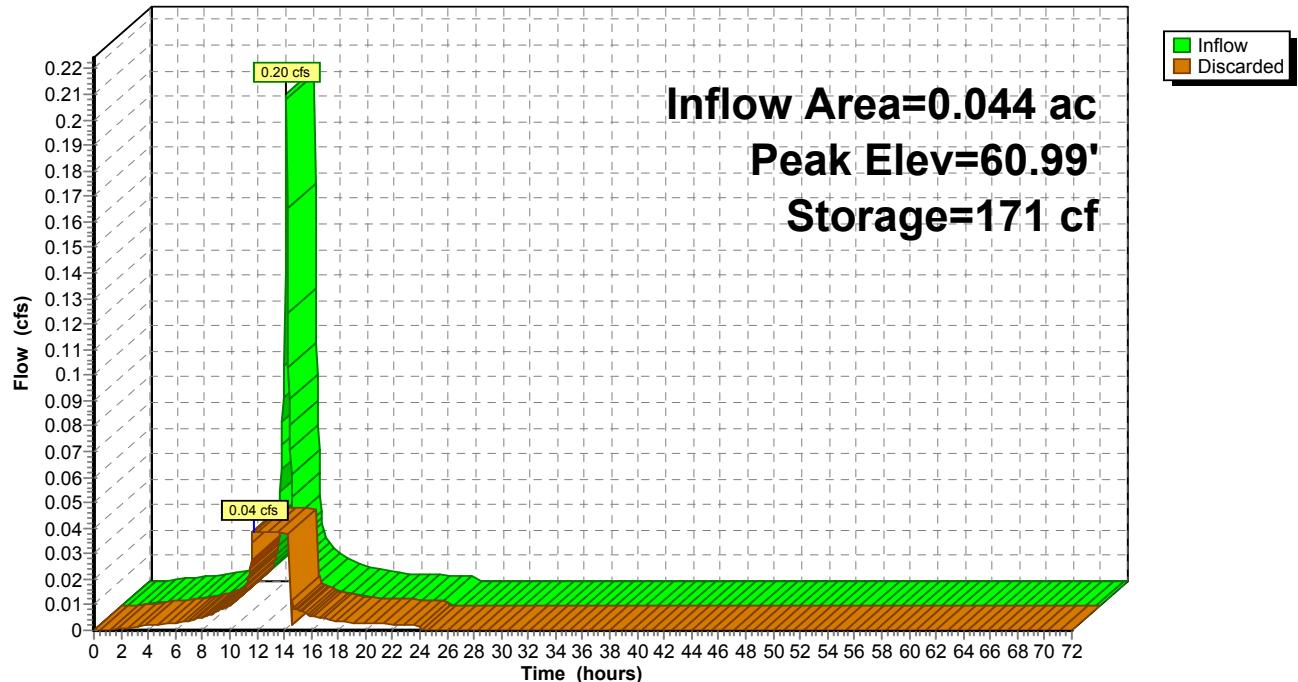
Overall Storage Efficiency = 58.7%

4 Chambers

26.2 cy Field

18.0 cy Stone



Pond P10: Infiltration Chambers**Hydrograph**

Summary for Pond P11: Infiltration Chambers

Inflow Area = 0.087 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.40 cfs @ 12.09 hrs, Volume= 0.033 af
 Outflow = 0.06 cfs @ 11.70 hrs, Volume= 0.033 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.70 hrs, Volume= 0.033 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 64.79' @ 12.57 hrs Surf.Area= 332 sf Storage= 383 cf

Plug-Flow detention time= 32.8 min calculated for 0.033 af (100% of inflow)
 Center-of-Mass det. time= 32.7 min (781.4 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	63.00'	321 cf	6.33'W x 52.50'L x 3.54'H Field A 1,178 cf Overall - 376 cf Embedded = 801 cf x 40.0% Voids
#2A	63.50'	376 cf	Cultec R-330XLHD x 7 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
697 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.06 cfs @ 11.70 hrs HW=63.05' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.06 cfs)

Pond P11: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

7 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 50.50' Row Length +12.0" End Stone x 2 = 52.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

7 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 376.3 cf Chamber Storage

1,177.6 cf Field - 376.3 cf Chambers = 801.3 cf Stone x 40.0% Voids = 320.5 cf Stone Storage

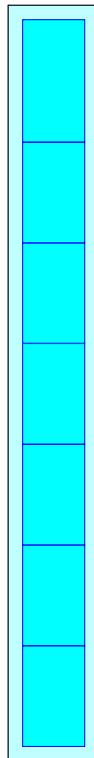
Chamber Storage + Stone Storage = 696.8 cf = 0.016 af

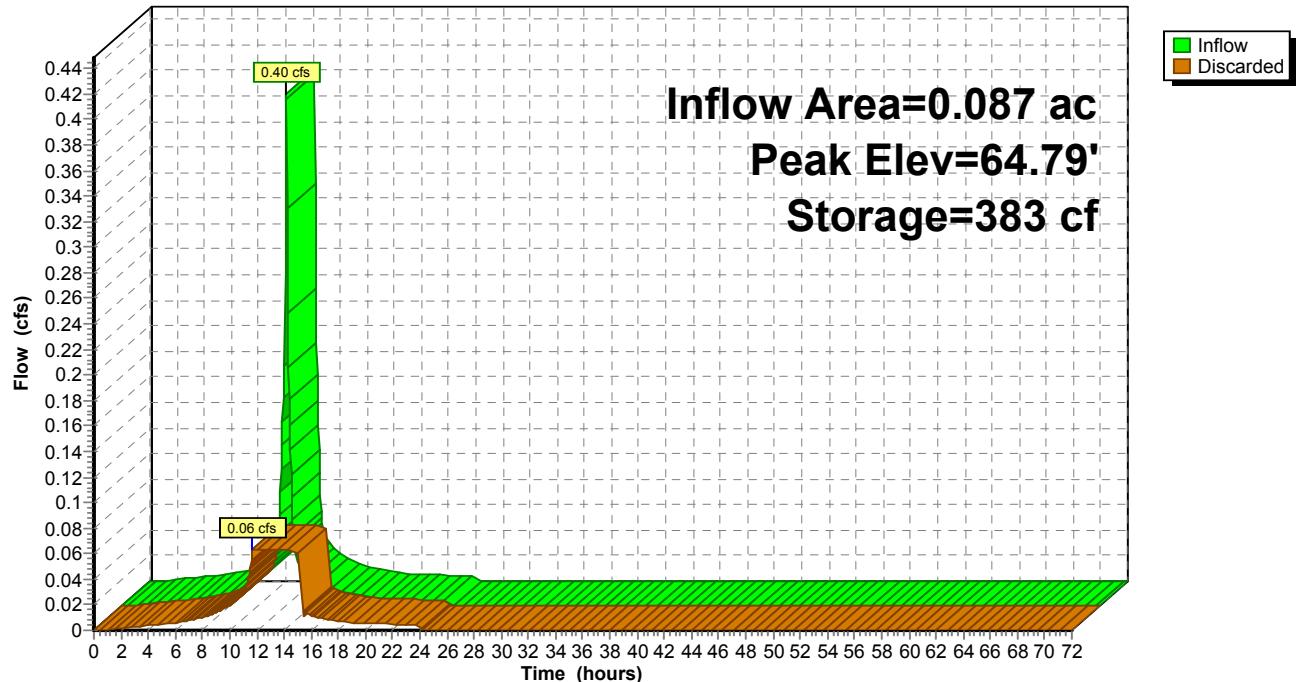
Overall Storage Efficiency = 59.2%

7 Chambers

43.6 cy Field

29.7 cy Stone



Pond P11: Infiltration Chambers**Hydrograph**

Summary for Pond P12: Infiltration Chambers

Inflow Area = 0.168 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.77 cfs @ 12.09 hrs, Volume= 0.064 af
 Outflow = 0.19 cfs @ 11.80 hrs, Volume= 0.064 af, Atten= 76%, Lag= 0.0 min
 Discarded = 0.19 cfs @ 11.80 hrs, Volume= 0.064 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.14' @ 12.47 hrs Surf.Area= 977 sf Storage= 545 cf

Plug-Flow detention time= 13.4 min calculated for 0.064 af (100% of inflow)
 Center-of-Mass det. time= 13.4 min (762.1 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	875 cf	11.17'W x 87.50'L x 3.54'H Field A 3,461 cf Overall - 1,274 cf Embedded = 2,186 cf x 40.0% Voids
#2A	56.70'	1,274 cf	Cultec R-330XLHD x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
2,149 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.19 cfs @ 11.80 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.19 cfs)

Pond P12: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

12 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 85.50' Row Length +12.0" End Stone x 2 = 87.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

24 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,274.1 cf Chamber Storage

3,460.5 cf Field - 1,274.1 cf Chambers = 2,186.4 cf Stone x 40.0% Voids = 874.6 cf Stone Storage

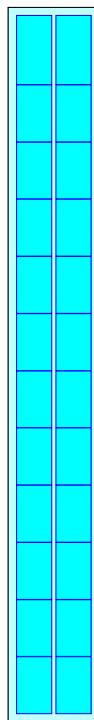
Chamber Storage + Stone Storage = 2,148.7 cf = 0.049 af

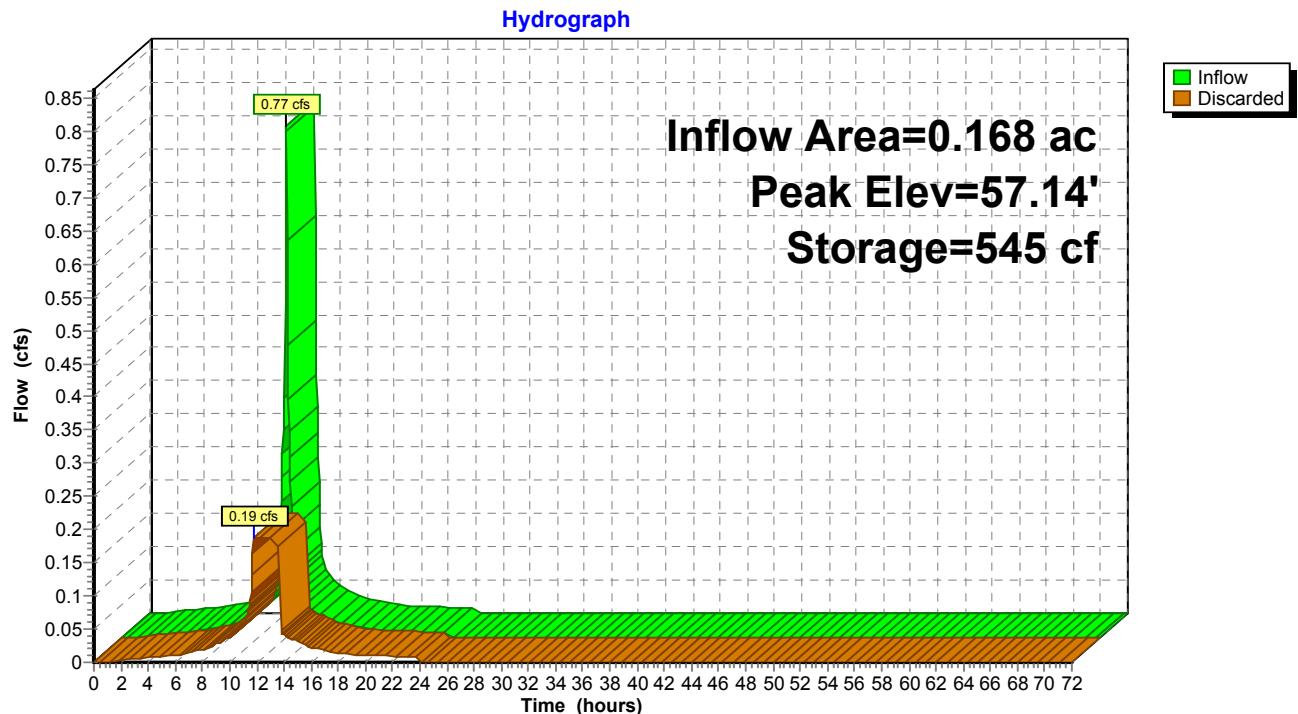
Overall Storage Efficiency = 62.1%

24 Chambers

128.2 cy Field

81.0 cy Stone



Pond P12: Infiltration Chambers

Summary for Pond P13: Infiltration Chambers

Inflow Area = 0.138 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.63 cfs @ 12.09 hrs, Volume= 0.052 af
 Outflow = 0.19 cfs @ 11.90 hrs, Volume= 0.052 af, Atten= 70%, Lag= 0.0 min
 Discarded = 0.19 cfs @ 11.90 hrs, Volume= 0.052 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 56.91' @ 12.41 hrs Surf.Area= 977 sf Storage= 365 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 8.5 min (757.2 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	875 cf	11.17'W x 87.50'L x 3.54'H Field A 3,461 cf Overall - 1,274 cf Embedded = 2,186 cf x 40.0% Voids
#2A	56.70'	1,274 cf	Cultec R-330XLHD x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
2,149 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.19 cfs @ 11.90 hrs HW=56.26' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.19 cfs)

Pond P13: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

12 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 85.50' Row Length +12.0" End Stone x 2 = 87.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

24 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,274.1 cf Chamber Storage

3,460.5 cf Field - 1,274.1 cf Chambers = 2,186.4 cf Stone x 40.0% Voids = 874.6 cf Stone Storage

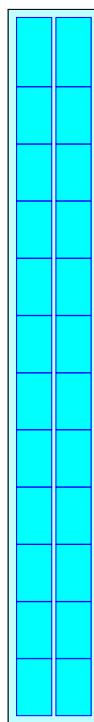
Chamber Storage + Stone Storage = 2,148.7 cf = 0.049 af

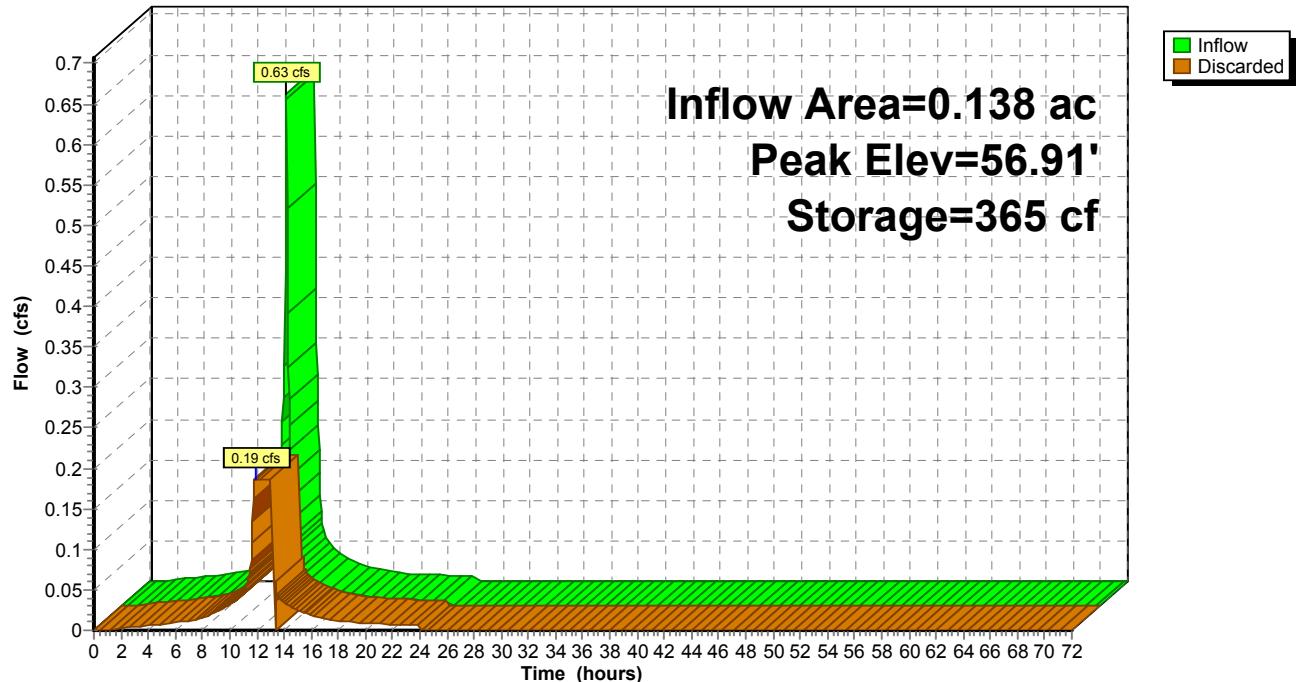
Overall Storage Efficiency = 62.1%

24 Chambers

128.2 cy Field

81.0 cy Stone



Pond P13: Infiltration Chambers**Hydrograph**

Summary for Pond P14: Infiltration Chambers

Inflow Area = 0.173 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.79 cfs @ 12.09 hrs, Volume= 0.066 af
 Outflow = 0.13 cfs @ 11.70 hrs, Volume= 0.066 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.13 cfs @ 11.70 hrs, Volume= 0.066 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.19' @ 12.56 hrs Surf.Area= 664 sf Storage= 756 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 32.2 min (780.9 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	58.50'	599 cf	11.17'W x 59.50'L x 3.54'H Field A 2,353 cf Overall - 857 cf Embedded = 1,496 cf x 40.0% Voids
#2A	59.00'	857 cf	Cultec R-330XLHD x 16 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
1,455 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	58.50'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.13 cfs @ 11.70 hrs HW=58.55' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.13 cfs)

Pond P14: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

8 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 57.50' Row Length +12.0" End Stone x 2 = 59.50'
Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

16 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 856.9 cf Chamber Storage

2,353.1 cf Field - 856.9 cf Chambers = 1,496.3 cf Stone x 40.0% Voids = 598.5 cf Stone Storage

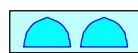
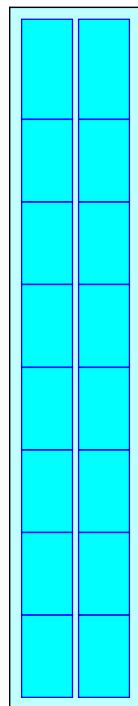
Chamber Storage + Stone Storage = 1,455.4 cf = 0.033 af

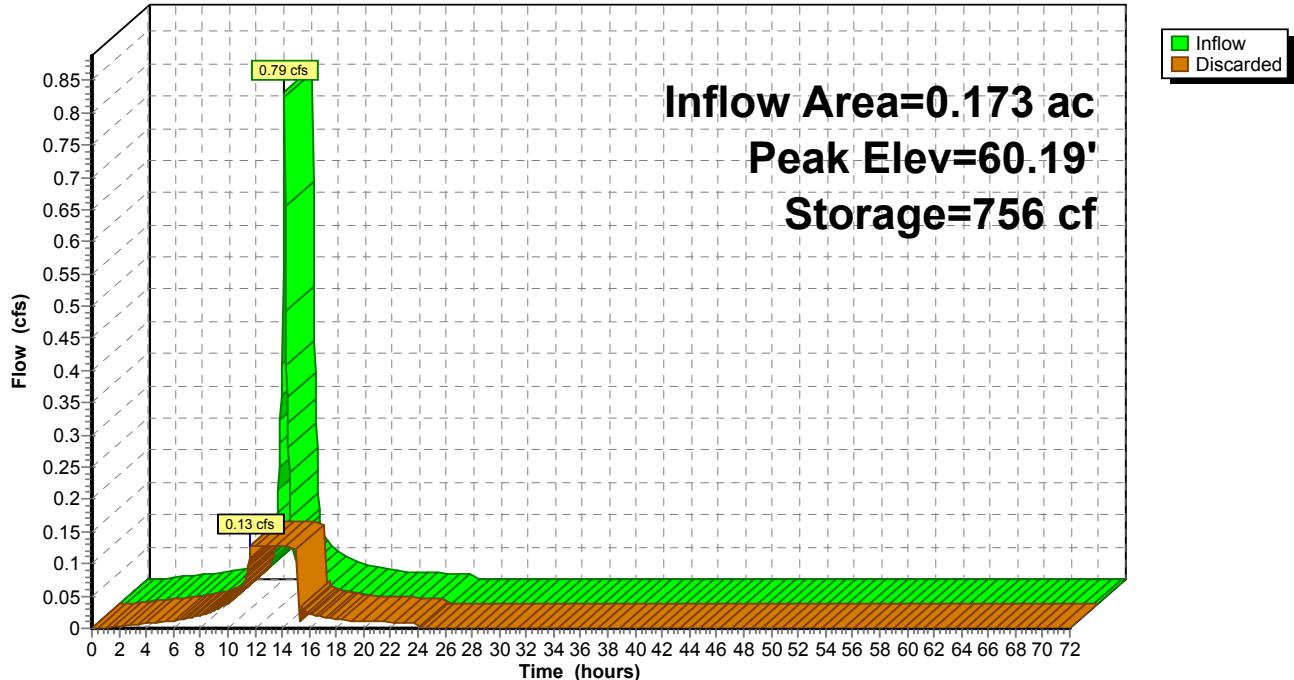
Overall Storage Efficiency = 61.8%

16 Chambers

87.2 cy Field

55.4 cy Stone



Pond P14: Infiltration Chambers**Hydrograph**

Summary for Pond P15: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.00' @ 12.52 hrs Surf.Area= 111 sf Storage= 94 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 22.2 min (770.9 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P15: Infiltration Chambers - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

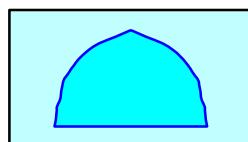
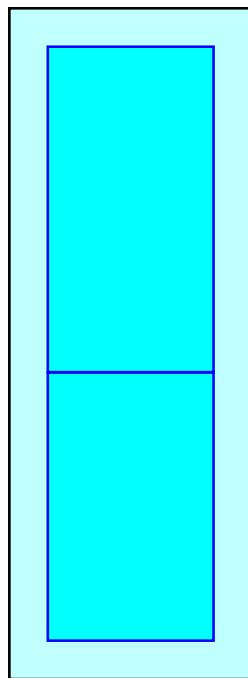
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

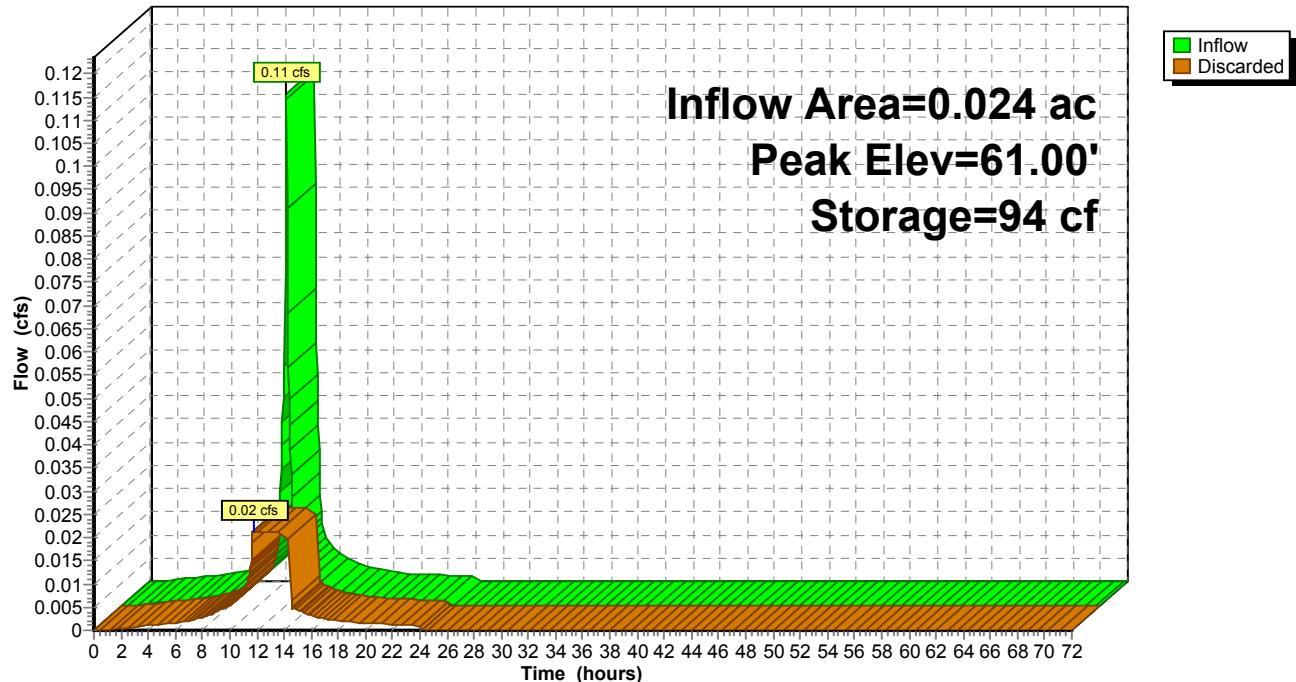
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P15: Infiltration Chambers**Hydrograph**

Summary for Pond P16: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.01' @ 12.52 hrs Surf.Area= 111 sf Storage= 95 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 22.6 min (771.3 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P16: Infiltration Chambers - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

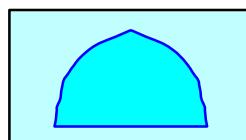
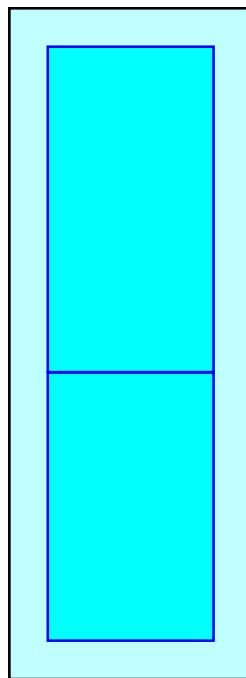
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

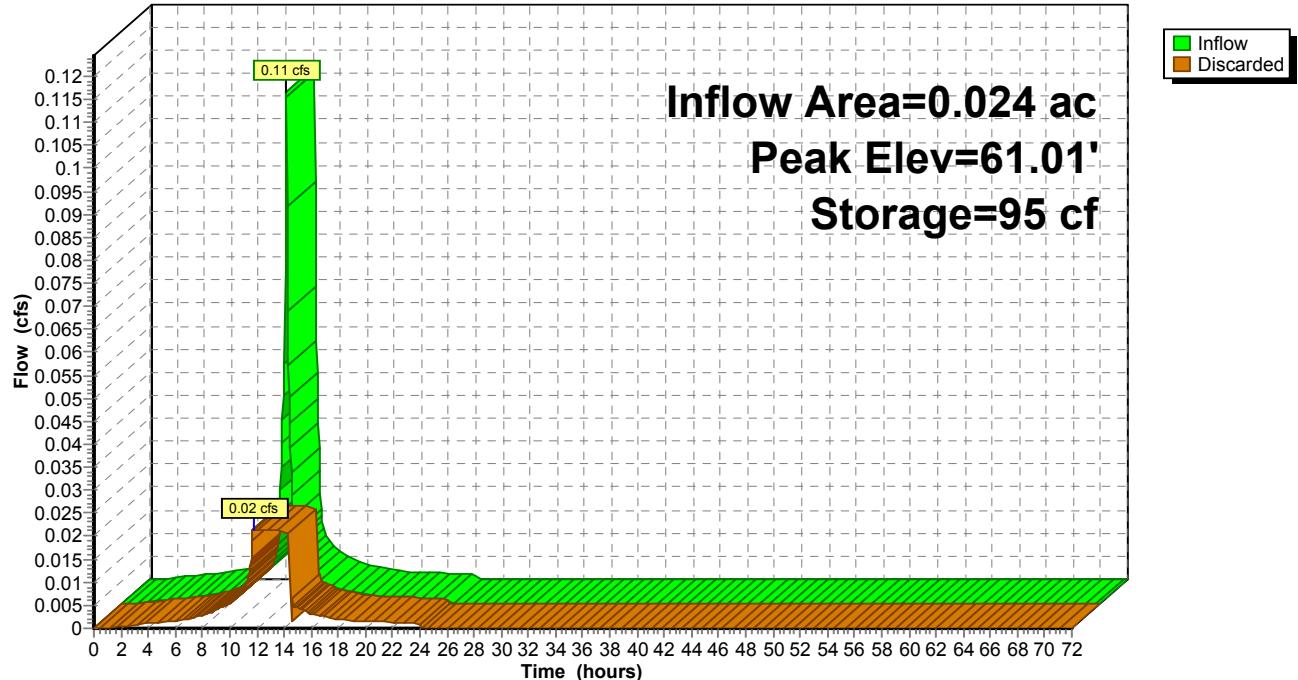
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P16: Infiltration Chambers**Hydrograph**

Summary for Pond P17: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.99' @ 12.52 hrs Surf.Area= 111 sf Storage= 93 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 22.0 min (770.7 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P17: Infiltration Chambers - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

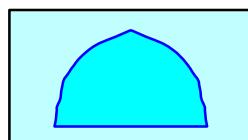
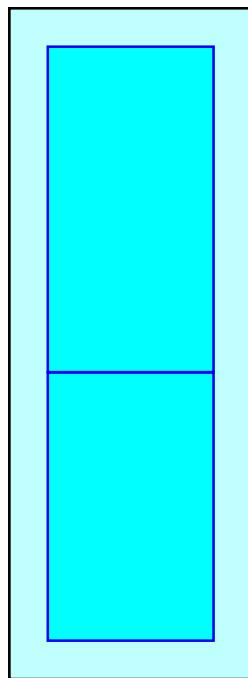
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

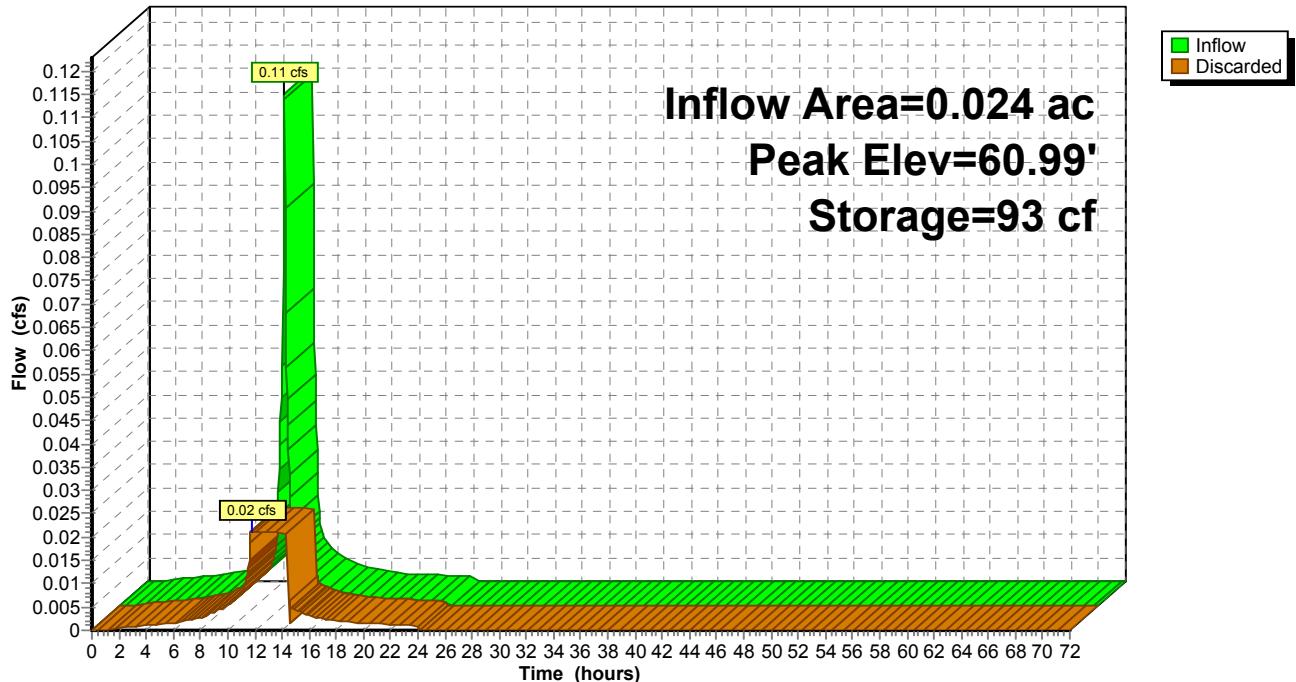
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P17: Infiltration Chambers**Hydrograph**

Summary for Pond P18: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.98' @ 12.52 hrs Surf.Area= 111 sf Storage= 93 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 21.9 min (770.6 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P18: Infiltration Chambers - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

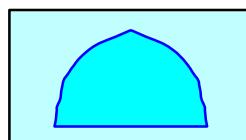
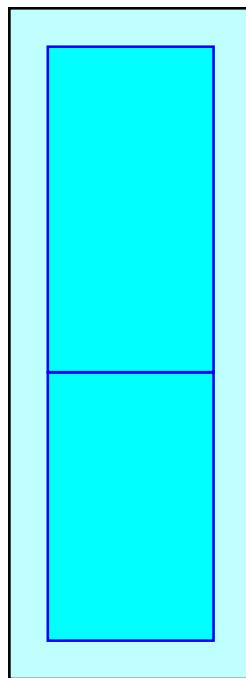
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

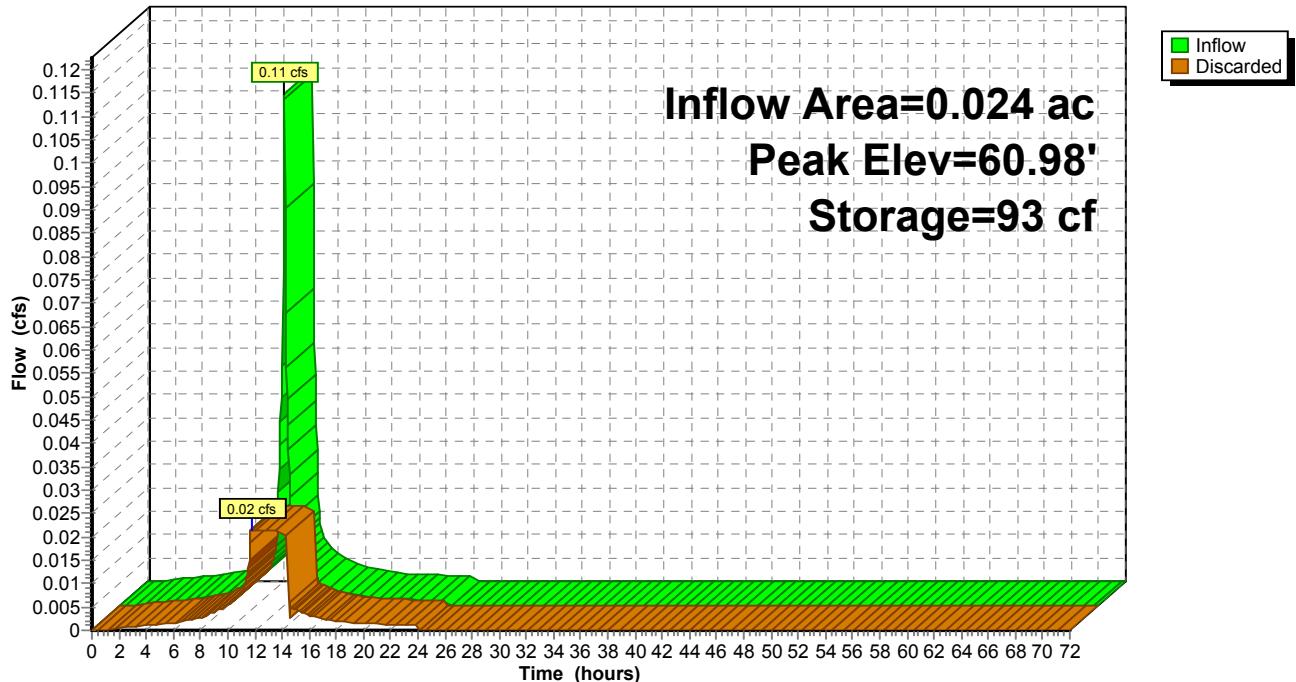
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P18: Infiltration Chambers**Hydrograph**

Summary for Pond P2: Infiltration Chambers

Inflow Area = 0.349 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 1.60 cfs @ 12.09 hrs, Volume= 0.133 af
 Outflow = 0.27 cfs @ 11.70 hrs, Volume= 0.133 af, Atten= 83%, Lag= 0.0 min
 Discarded = 0.27 cfs @ 11.70 hrs, Volume= 0.133 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.77' @ 12.56 hrs Surf.Area= 1,385 sf Storage= 1,496 cf

Plug-Flow detention time= 30.1 min calculated for 0.133 af (100% of inflow)
 Center-of-Mass det. time= 30.1 min (778.8 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	1,194 cf	20.83'W x 66.50'L x 3.54'H Field A 4,907 cf Overall - 1,922 cf Embedded = 2,984 cf x 40.0% Voids
#2A	56.70'	1,922 cf	Cultec R-330XLHD x 36 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
3,116 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.27 cfs @ 11.70 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.27 cfs)

Pond P2: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

9 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 64.50' Row Length +12.0" End Stone x 2 = 66.50'
Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

36 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 1,922.4 cf Chamber Storage

4,906.7 cf Field - 1,922.4 cf Chambers = 2,984.3 cf Stone x 40.0% Voids = 1,193.7 cf Stone Storage

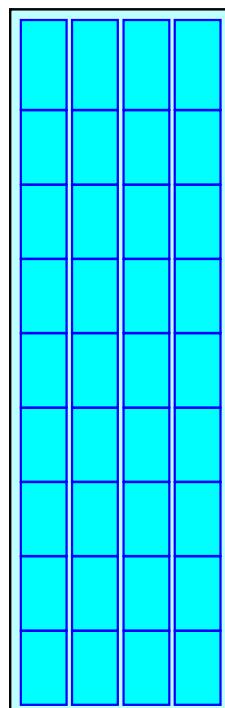
Chamber Storage + Stone Storage = 3,116.1 cf = 0.072 af

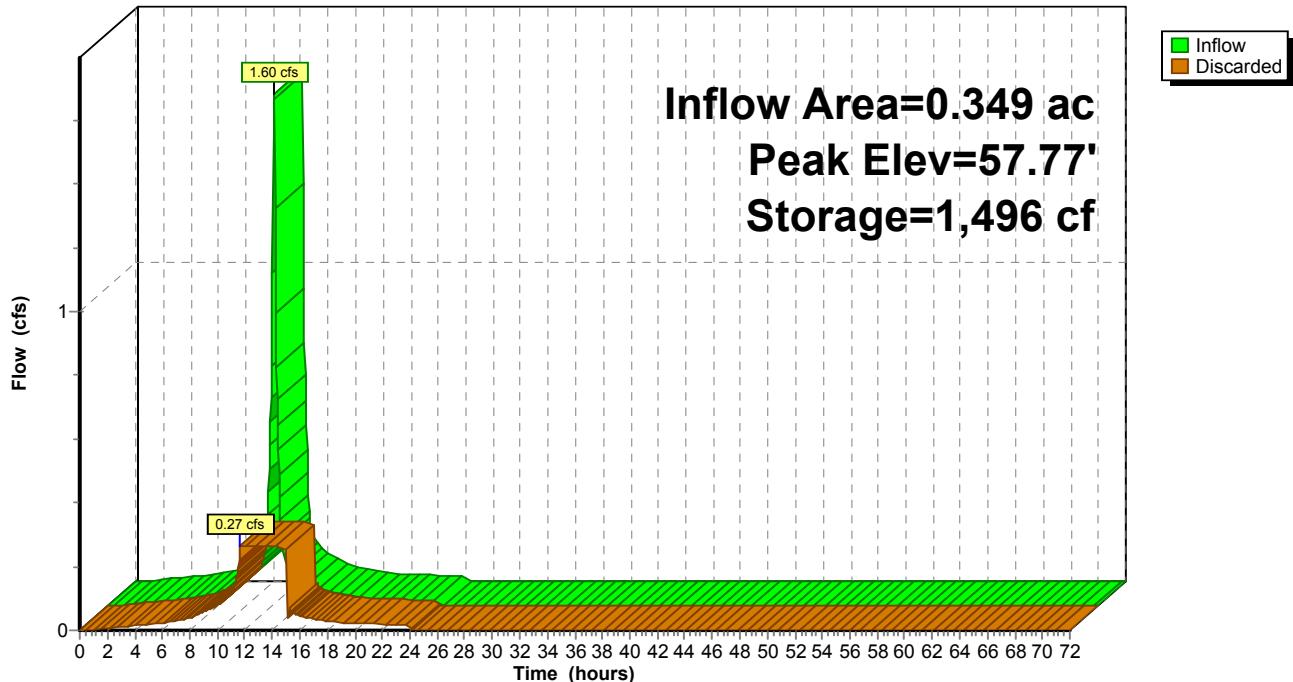
Overall Storage Efficiency = 63.5%

36 Chambers

181.7 cy Field

110.5 cy Stone



Pond P2: Infiltration Chambers**Hydrograph**

Summary for Pond P3: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.60' @ 12.52 hrs Surf.Area= 111 sf Storage= 94 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 22.2 min (770.9 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	56.70'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=56.25' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P3: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

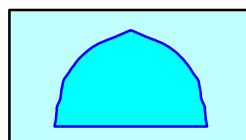
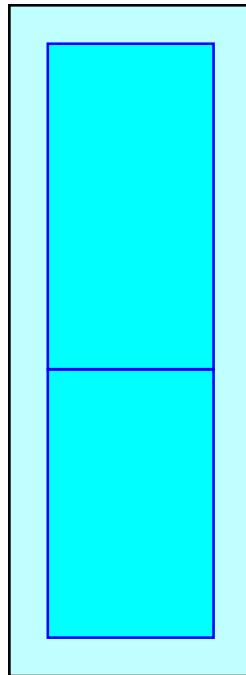
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

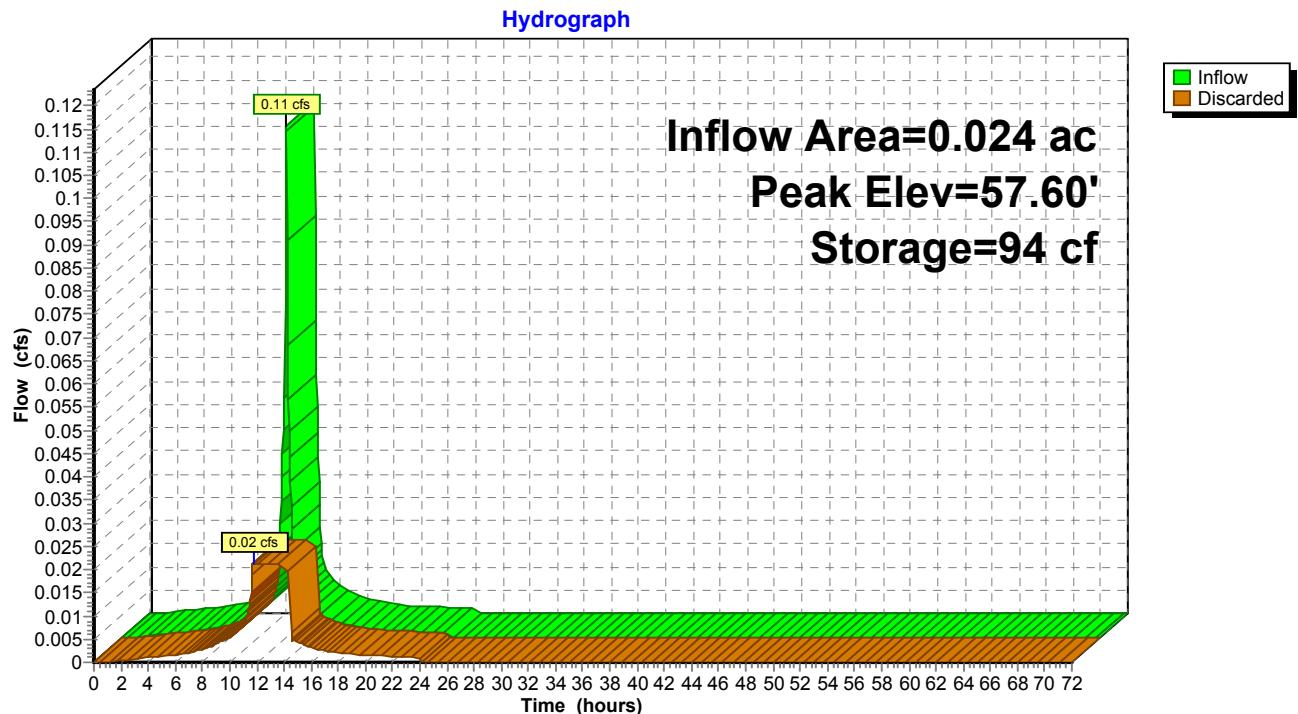
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P3: Infiltration Chambers

Summary for Pond P4: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.59' @ 12.52 hrs Surf.Area= 111 sf Storage= 93 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 22.1 min (770.8 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	56.70'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=56.25' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P4: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

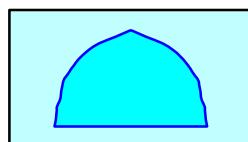
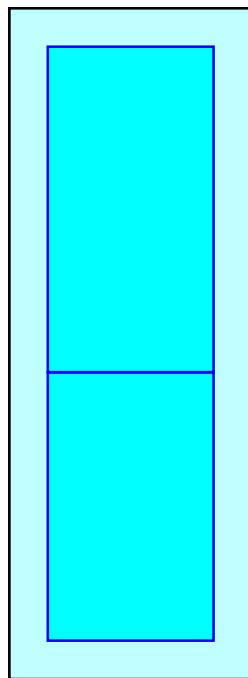
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

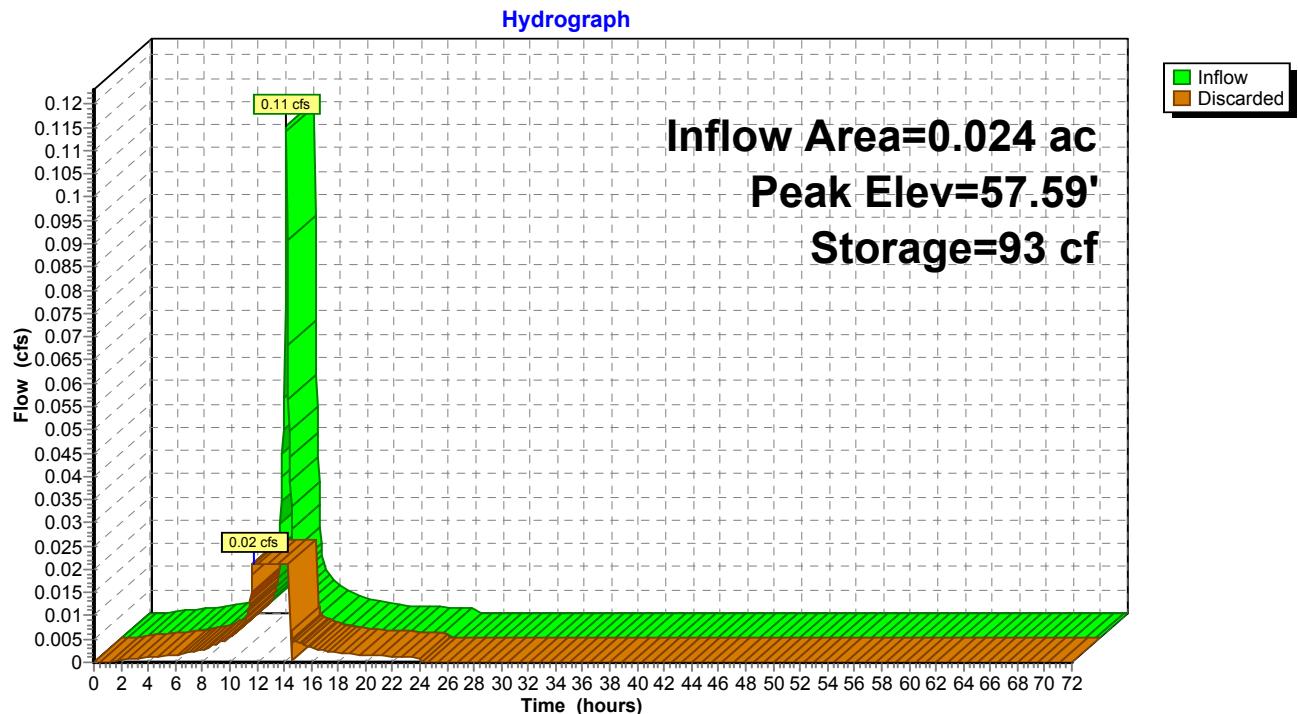
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P4: Infiltration Chambers

Summary for Pond P5: Infiltration Chambers

Inflow Area = 0.039 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.18 cfs @ 12.09 hrs, Volume= 0.015 af
 Outflow = 0.04 cfs @ 11.75 hrs, Volume= 0.015 af, Atten= 78%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.75 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.38' @ 12.49 hrs Surf.Area= 208 sf Storage= 137 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 16.4 min (765.1 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	167 cf	4.75'W x 43.75'L x 2.54'H Field A 528 cf Overall - 111 cf Embedded = 418 cf x 40.0% Voids
#2A	56.70'	111 cf	Cultec R-150XLHD x 4 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 1 rows
278 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.75 hrs HW=56.23' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P5: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 1 rows

4 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 41.75' Row Length +12.0" End Stone x 2 = 43.75' Base Length

1 Rows x 33.0" Wide + 12.0" Side Stone x 2 = 4.75' Base Width

6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

4 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 1 Rows = 110.6 cf Chamber Storage

528.2 cf Field - 110.6 cf Chambers = 417.6 cf Stone x 40.0% Voids = 167.0 cf Stone Storage

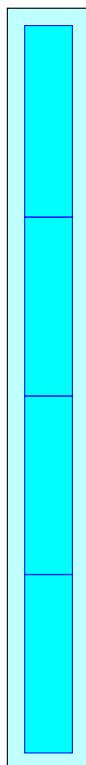
Chamber Storage + Stone Storage = 277.6 cf = 0.006 af

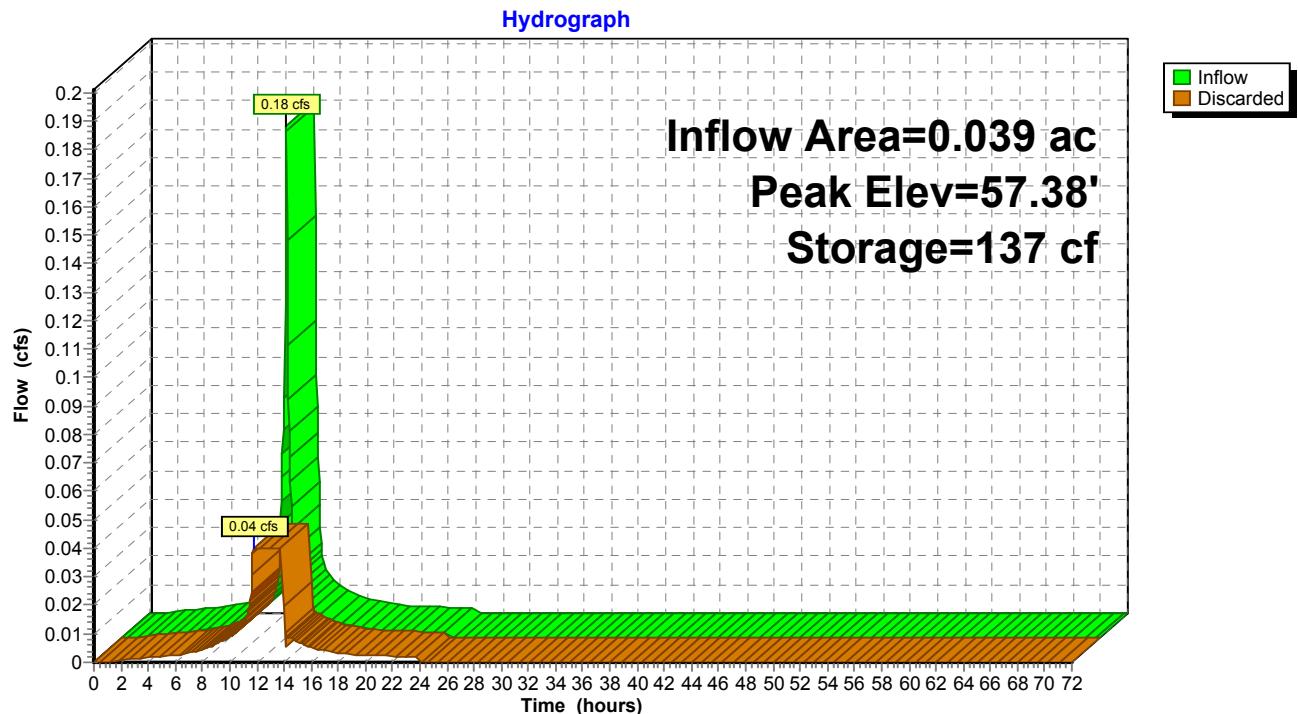
Overall Storage Efficiency = 52.6%

4 Chambers

19.6 cy Field

15.5 cy Stone



Pond P5: Infiltration Chambers

Summary for Pond P6: Infiltration Chambers

Inflow Area = 0.019 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.09 cfs @ 12.09 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 11.80 hrs, Volume= 0.007 af, Atten= 76%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.80 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.64' @ 12.47 hrs Surf.Area= 110 sf Storage= 62 cf

Plug-Flow detention time= 13.5 min calculated for 0.007 af (100% of inflow)
 Center-of-Mass det. time= 13.5 min (762.2 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	90 cf	4.75'W x 23.25'L x 2.54'H Field A 281 cf Overall - 56 cf Embedded = 224 cf x 40.0% Voids
#2A	60.10'	56 cf	Cultec R-150XLHD x 2 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 1 rows
146 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.80 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P6: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 1 rows

2 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 21.25' Row Length +12.0" End Stone x 2 = 23.25' Base Length

1 Rows x 33.0" Wide + 12.0" Side Stone x 2 = 4.75' Base Width

6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

2 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 1 Rows = 56.3 cf Chamber Storage

280.7 cf Field - 56.3 cf Chambers = 224.4 cf Stone x 40.0% Voids = 89.8 cf Stone Storage

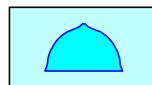
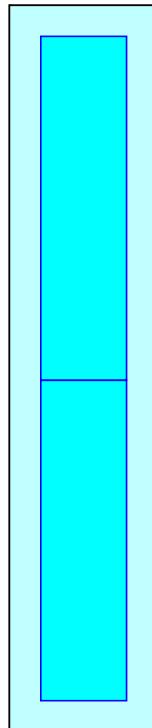
Chamber Storage + Stone Storage = 146.1 cf = 0.003 af

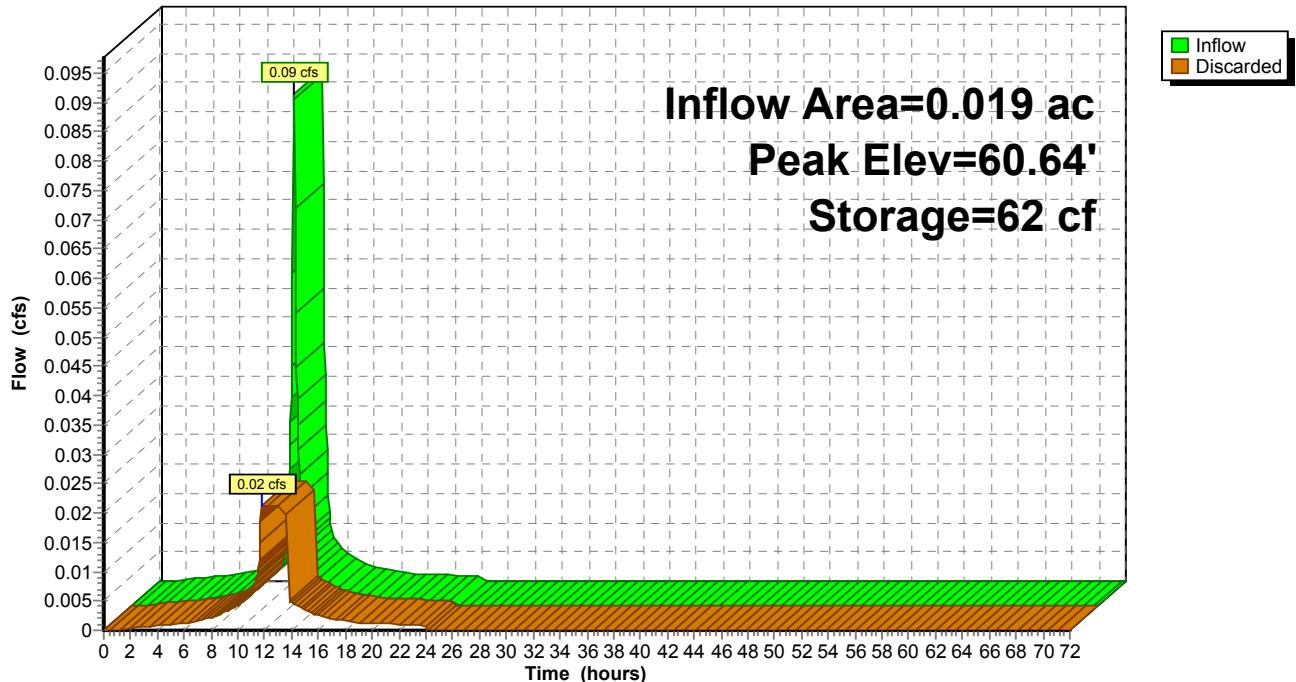
Overall Storage Efficiency = 52.0%

2 Chambers

10.4 cy Field

8.3 cy Stone



Pond P6: Infiltration Chambers**Hydrograph**

Summary for Pond P7: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.99' @ 12.52 hrs Surf.Area= 111 sf Storage= 94 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 22.2 min (770.9 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P7: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

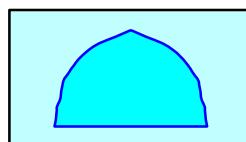
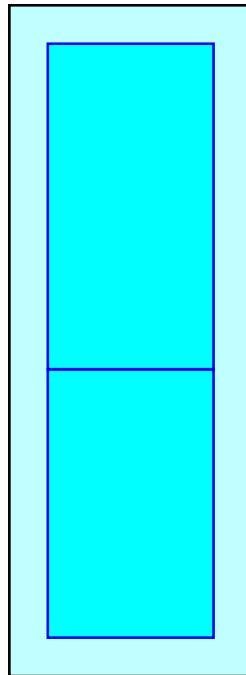
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

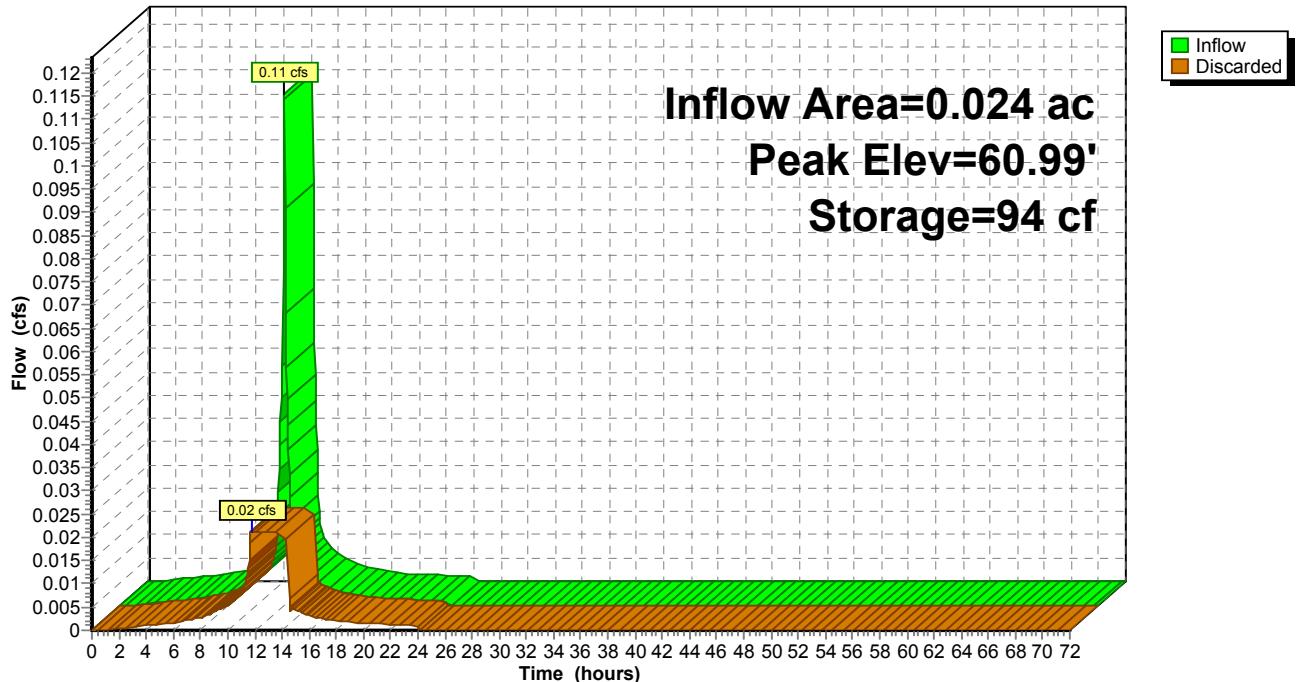
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P7: Infiltration Chambers**Hydrograph**

Summary for Pond P8: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.99' @ 12.52 hrs Surf.Area= 111 sf Storage= 94 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 22.2 min (770.9 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P8: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

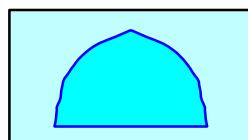
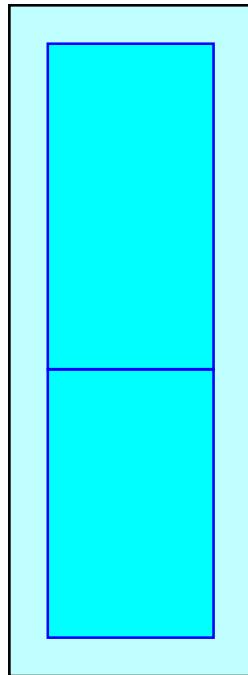
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

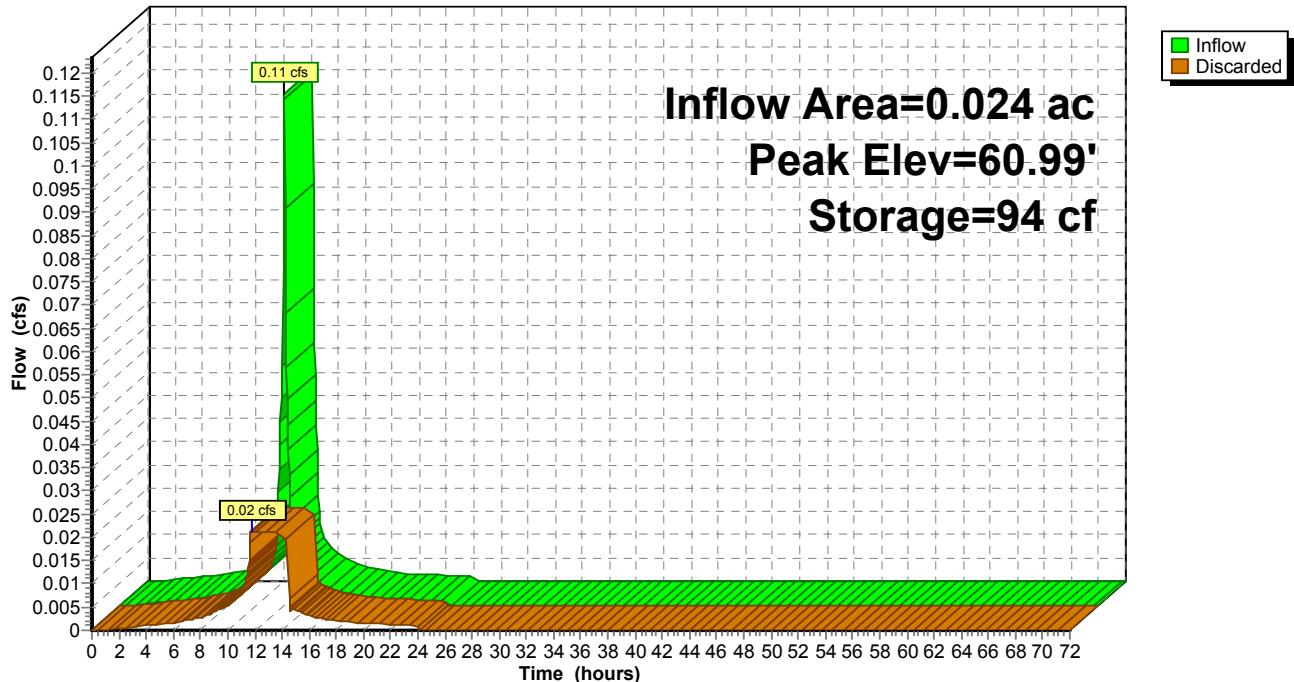
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P8: Infiltration Chambers**Hydrograph**

Summary for Pond P9: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 4.56" for 10-Year event
 Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.00' @ 12.52 hrs Surf.Area= 111 sf Storage= 94 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 22.2 min (770.9 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P9: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

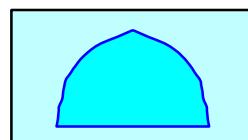
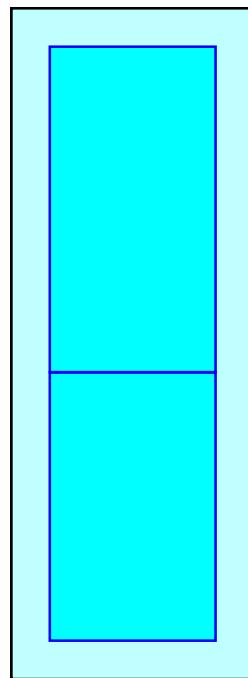
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

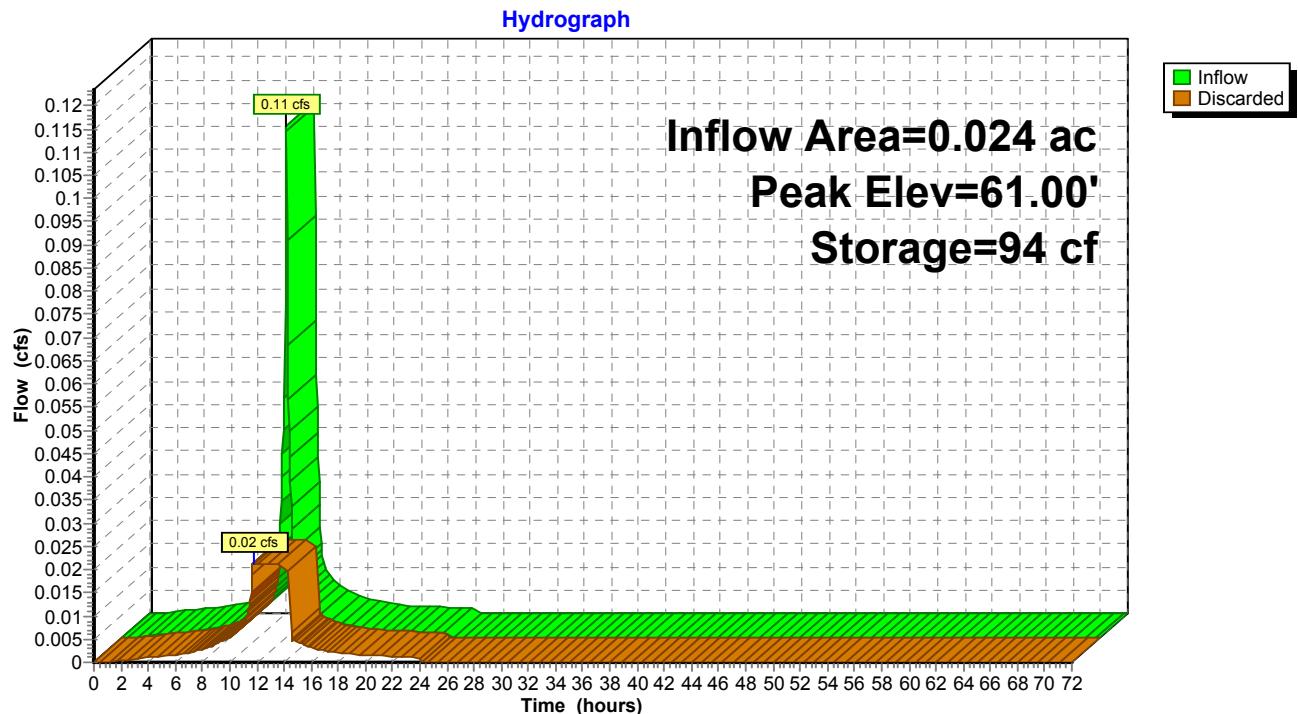
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P9: Infiltration Chambers

Summary for Pond W1: BVW

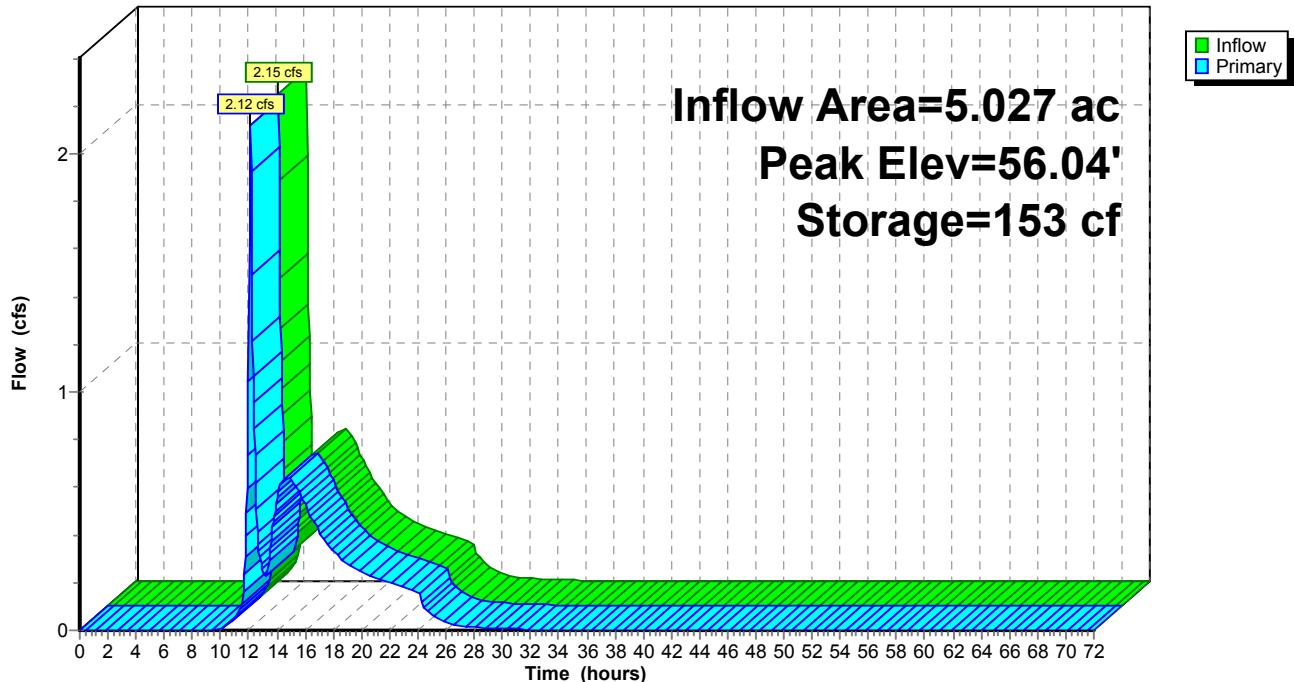
Inflow Area = 5.027 ac, 50.13% Impervious, Inflow Depth = 1.00" for 10-Year event
 Inflow = 2.15 cfs @ 12.10 hrs, Volume= 0.419 af
 Outflow = 2.12 cfs @ 12.11 hrs, Volume= 0.419 af, Atten= 1%, Lag= 0.9 min
 Primary = 2.12 cfs @ 12.11 hrs, Volume= 0.419 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 56.04' @ 12.11 hrs Surf.Area= 4,350 sf Storage= 153 cf

Plug-Flow detention time= 2.1 min calculated for 0.418 af (100% of inflow)
 Center-of-Mass det. time= 2.2 min (1,000.7 - 998.5)

Volume	Invert	Avail.Storage	Storage Description			
#1	56.00'	11,314 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
56.00	3,962	413.1	0	0	3,962	
57.00	20,884	797.8	11,314	11,314	41,037	
Device	Routing	Invert	Outlet Devices			
#1	Primary	56.00'	120.0' long x 10.0' breadth Broad-Crested Rectangular Weir			
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60			
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64			

Primary OutFlow Max=2.06 cfs @ 12.11 hrs HW=56.04' TW=0.00' (Dynamic Tailwater)
 ↑ 1=Broad-Crested Rectangular Weir (Weir Controls 2.06 cfs @ 0.47 fps)

Pond W1: BVW**Hydrograph**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Sub-1	Runoff Area=11,515 sf 47.75% Impervious Runoff Depth=2.31" Tc=6.0 min CN=67 Runoff=0.69 cfs 0.051 af
Subcatchment2S: Sub-2	Runoff Area=8,566 sf 7.82% Impervious Runoff Depth=0.63" Tc=6.0 min CN=44 Runoff=0.07 cfs 0.010 af
Subcatchment3A-10R: Roofs 15 B	Runoff Area=857 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment3A-10R1: Roofs 15 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-11R: Roofs 16-17 FB	Runoff Area=3,806 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.48 cfs 0.040 af
Subcatchment3A-12R: Roofs 18-21 F	Runoff Area=4,201 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.53 cfs 0.044 af
Subcatchment3A-12R1: Roofs 22-24 F	Runoff Area=3,124 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.39 cfs 0.033 af
Subcatchment3A-14R: Roofs 25-28 F	Runoff Area=4,152 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.52 cfs 0.043 af
Subcatchment3A-14R1: Roofs 29-30 B	Runoff Area=1,686 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af
Subcatchment3A-14R2: Roofs 31-32 B	Runoff Area=1,707 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af
Subcatchment3A-15R: Roofs 29-30 F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-16R: Roofs 29-30 F	Runoff Area=1,057 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-17R: Roofs 31-32 F	Runoff Area=1,043 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-18R: Roofs 31-32 F	Runoff Area=1,041 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-1R: Roof 5	Runoff Area=1,903 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.24 cfs 0.020 af
Subcatchment3A-2R: Roofs 1-4 FB	Runoff Area=7,608 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.95 cfs 0.080 af

Subcatchment3A-2R1: Roofs 6-9 FB	Runoff Area=7,608 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.95 cfs 0.080 af
Subcatchment3A-3R: Roofs 10-F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-4R: Roofs 11 F	Runoff Area=1,045 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-5R: Roofs 10-11 B	Runoff Area=1,707 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af
Subcatchment3A-6R: Roofs 12 B	Runoff Area=829 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.10 cfs 0.009 af
Subcatchment3A-7R: Roofs 12 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-8R: Roofs 13 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-9R: Roofs 14 F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-S: Sub-3A	Runoff Area=160,799 sf 55.72% Impervious Runoff Depth=2.84" Tc=6.0 min CN=73 Runoff=12.04 cfs 0.874 af
Subcatchment3B-S: Sub-3B	Runoff Area=42,013 sf 40.23% Impervious Runoff Depth=2.66" Tc=6.0 min CN=71 Runoff=2.93 cfs 0.214 af
Subcatchment3C-S: Sub-3C	Runoff Area=16,169 sf 20.21% Impervious Runoff Depth=1.42" Tc=6.0 min CN=56 Runoff=0.54 cfs 0.044 af
Subcatchment4S-1: Sub-4	Runoff Area=11,741 sf 37.46% Impervious Runoff Depth=1.81" Tc=6.0 min CN=61 Runoff=0.53 cfs 0.041 af
Subcatchment4S-1R: Roofs 22-24 B	Runoff Area=2,596 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.32 cfs 0.027 af
Subcatchment4S-2: Sub-4	Runoff Area=3,394 sf 9.16% Impervious Runoff Depth=0.63" Tc=6.0 min CN=44 Runoff=0.03 cfs 0.004 af
Subcatchment5S: Sub -5	Runoff Area=13,253 sf 9.23% Impervious Runoff Depth=0.68" Tc=6.0 min CN=45 Runoff=0.13 cfs 0.017 af
Subcatchment5S-1R: Roofs 18-21 B	Runoff Area=3,407 sf 100.00% Impervious Runoff Depth=5.46" Tc=6.0 min CN=98 Runoff=0.43 cfs 0.036 af
Reach DP-1: DMH	Inflow=0.69 cfs 0.051 af Outflow=0.69 cfs 0.051 af

Reach DP-2: DP-2	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach DP-3: DP-3	Inflow=2.91 cfs 0.695 af Outflow=2.91 cfs 0.695 af
Reach DP-4: PL	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach DP-5: PL	Inflow=0.13 cfs 0.017 af Outflow=0.13 cfs 0.017 af
Pond D-1: Depression	Peak Elev=59.01' Storage=4 cf Inflow=0.07 cfs 0.010 af Discarded=0.07 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.010 af
Pond D-2: Depression	Peak Elev=58.43' Storage=342 cf Inflow=0.54 cfs 0.044 af Discarded=0.17 cfs 0.044 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.044 af
Pond D-3: Depression	Peak Elev=63.85' Storage=863 cf Inflow=0.53 cfs 0.041 af Discarded=0.03 cfs 0.041 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.041 af
Pond D-4: Depression	Peak Elev=59.25' Storage=177 cf Inflow=0.03 cfs 0.004 af Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Pond DB-1: Prop Detention Basin	Peak Elev=60.54' Storage=20,532 cf Inflow=12.04 cfs 0.874 af Outflow=1.27 cfs 0.481 af
Pond P1: Infiltration Chambers	Peak Elev=57.99' Storage=228 cf Inflow=0.24 cfs 0.020 af Outflow=0.04 cfs 0.020 af
Pond P10: Infiltration Chambers	Peak Elev=61.38' Storage=227 cf Inflow=0.24 cfs 0.020 af Outflow=0.04 cfs 0.020 af
Pond P11: Infiltration Chambers	Peak Elev=65.30' Storage=498 cf Inflow=0.48 cfs 0.040 af Outflow=0.06 cfs 0.040 af
Pond P12: Infiltration Chambers	Peak Elev=57.40' Storage=748 cf Inflow=0.92 cfs 0.077 af Outflow=0.19 cfs 0.077 af
Pond P13: Infiltration Chambers	Peak Elev=57.11' Storage=520 cf Inflow=0.75 cfs 0.063 af Outflow=0.19 cfs 0.063 af
Pond P14: Infiltration Chambers	Peak Elev=60.65' Storage=983 cf Inflow=0.94 cfs 0.079 af Outflow=0.13 cfs 0.079 af
Pond P15: Infiltration Chambers	Peak Elev=61.39' Storage=124 cf Inflow=0.13 cfs 0.011 af Outflow=0.02 cfs 0.011 af
Pond P16: Infiltration Chambers	Peak Elev=61.41' Storage=126 cf Inflow=0.13 cfs 0.011 af Outflow=0.02 cfs 0.011 af

27-135 Post-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

*Type III 24-hr 25-Year Rainfall=5.70"*Page 229**Pond P17: Infiltration Chambers**Peak Elev=61.38' Storage=123 cf Inflow=0.13 cfs 0.011 af
Outflow=0.02 cfs 0.011 af**Pond P18: Infiltration Chambers**Peak Elev=61.37' Storage=123 cf Inflow=0.13 cfs 0.011 af
Outflow=0.02 cfs 0.011 af**Pond P2: Infiltration Chambers**Peak Elev=58.19' Storage=1,952 cf Inflow=1.90 cfs 0.159 af
Outflow=0.27 cfs 0.159 af**Pond P3: Infiltration Chambers**Peak Elev=57.99' Storage=124 cf Inflow=0.13 cfs 0.011 af
Outflow=0.02 cfs 0.011 af**Pond P4: Infiltration Chambers**Peak Elev=57.98' Storage=124 cf Inflow=0.13 cfs 0.011 af
Outflow=0.02 cfs 0.011 af**Pond P5: Infiltration Chambers**Peak Elev=57.75' Storage=186 cf Inflow=0.21 cfs 0.018 af
Outflow=0.04 cfs 0.018 af**Pond P6: Infiltration Chambers**Peak Elev=60.96' Storage=85 cf Inflow=0.10 cfs 0.009 af
Outflow=0.02 cfs 0.009 af**Pond P7: Infiltration Chambers**Peak Elev=61.39' Storage=124 cf Inflow=0.13 cfs 0.011 af
Outflow=0.02 cfs 0.011 af**Pond P8: Infiltration Chambers**Peak Elev=61.39' Storage=124 cf Inflow=0.13 cfs 0.011 af
Outflow=0.02 cfs 0.011 af**Pond P9: Infiltration Chambers**Peak Elev=61.39' Storage=124 cf Inflow=0.13 cfs 0.011 af
Outflow=0.02 cfs 0.011 af**Pond W1: BVW**Peak Elev=56.05' Storage=192 cf Inflow=2.93 cfs 0.695 af
Outflow=2.91 cfs 0.695 af**Total Runoff Area = 7.418 ac Runoff Volume = 1.837 af Average Runoff Depth = 2.97"**
45.06% Pervious = 3.342 ac 54.94% Impervious = 4.076 ac

Summary for Subcatchment 1S: Sub-1

Runoff = 0.69 cfs @ 12.10 hrs, Volume= 0.051 af, Depth= 2.31"

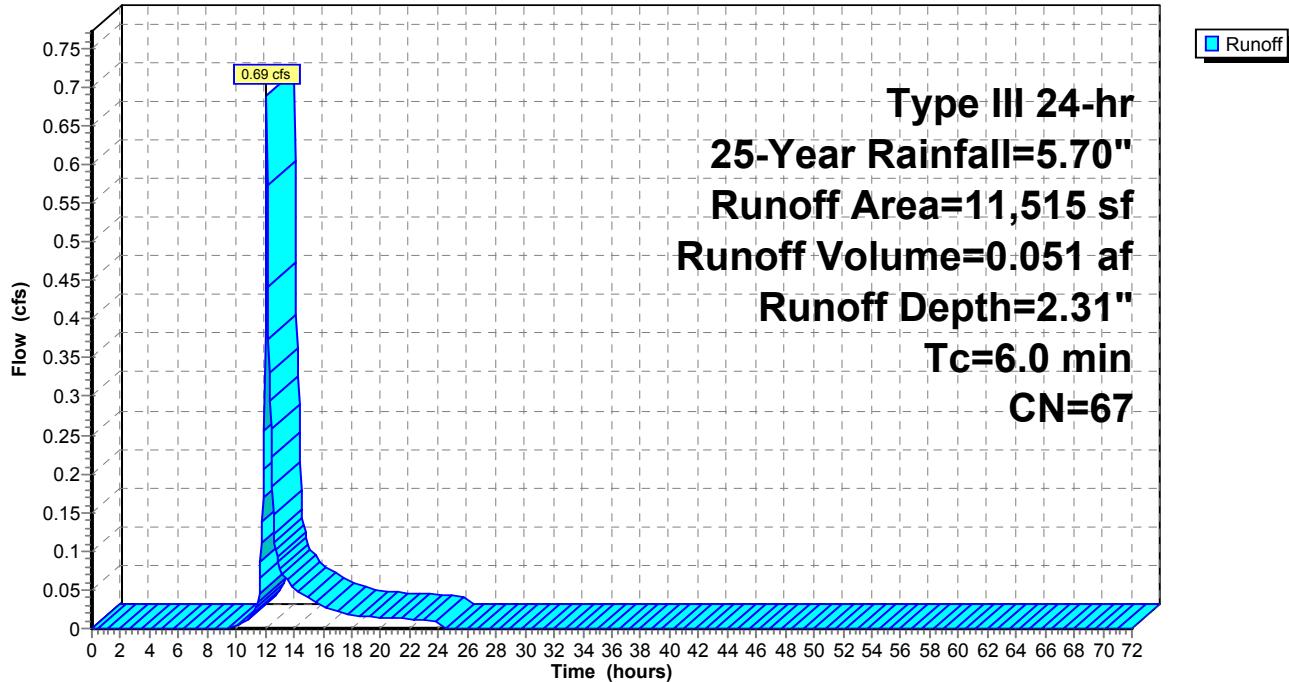
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
*		
5,498	98	Paved roads w/curbs & sewers, HSG A
6,017	39	>75% Grass cover, Good, HSG A
11,515	67	Weighted Average
6,017		52.25% Pervious Area
5,498		47.75% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 1S: Sub-1

Hydrograph



Summary for Subcatchment 2S: Sub-2

Runoff = 0.07 cfs @ 12.16 hrs, Volume= 0.010 af, Depth= 0.63"

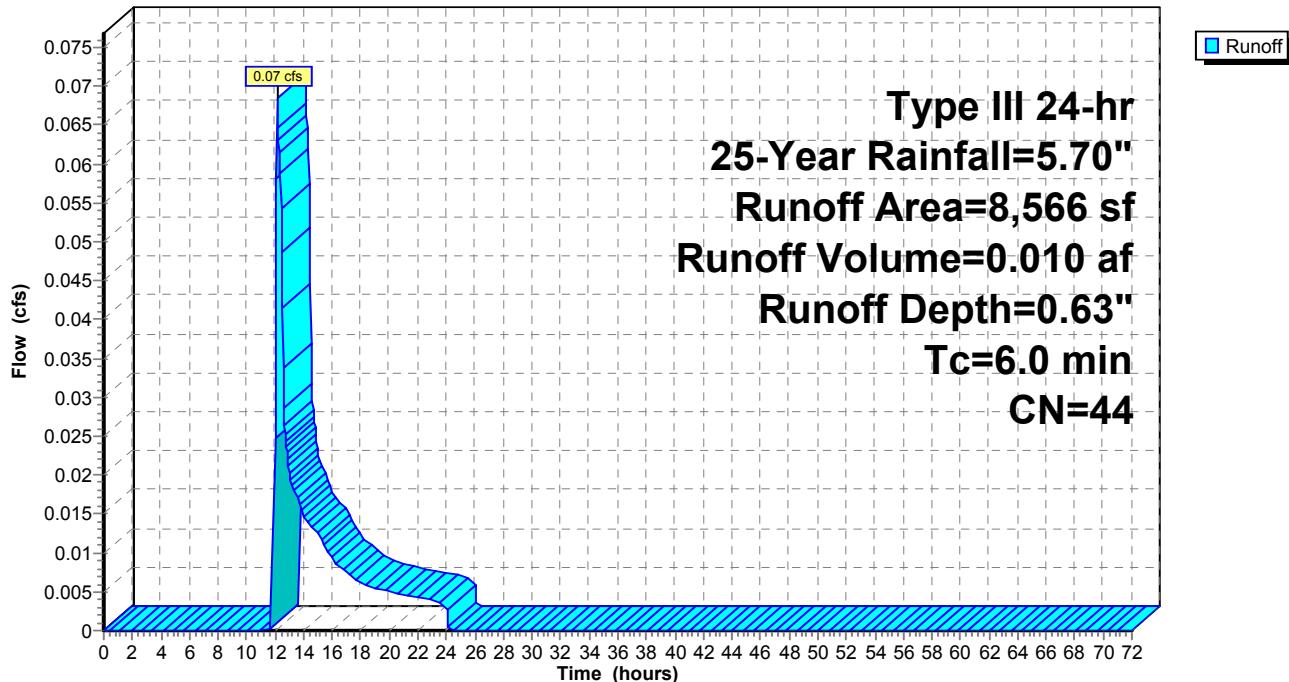
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
7,754	39	>75% Grass cover, Good, HSG A
*	100	Walls, HSG A
*	570	Decks, HSG A
142	39	>75% Grass cover, Good, HSG A
8,566	44	Weighted Average
7,896		92.18% Pervious Area
670		7.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 2S: Sub-2

Hydrograph



Summary for Subcatchment 3A-10R: Roofs 15 B

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 5.46"

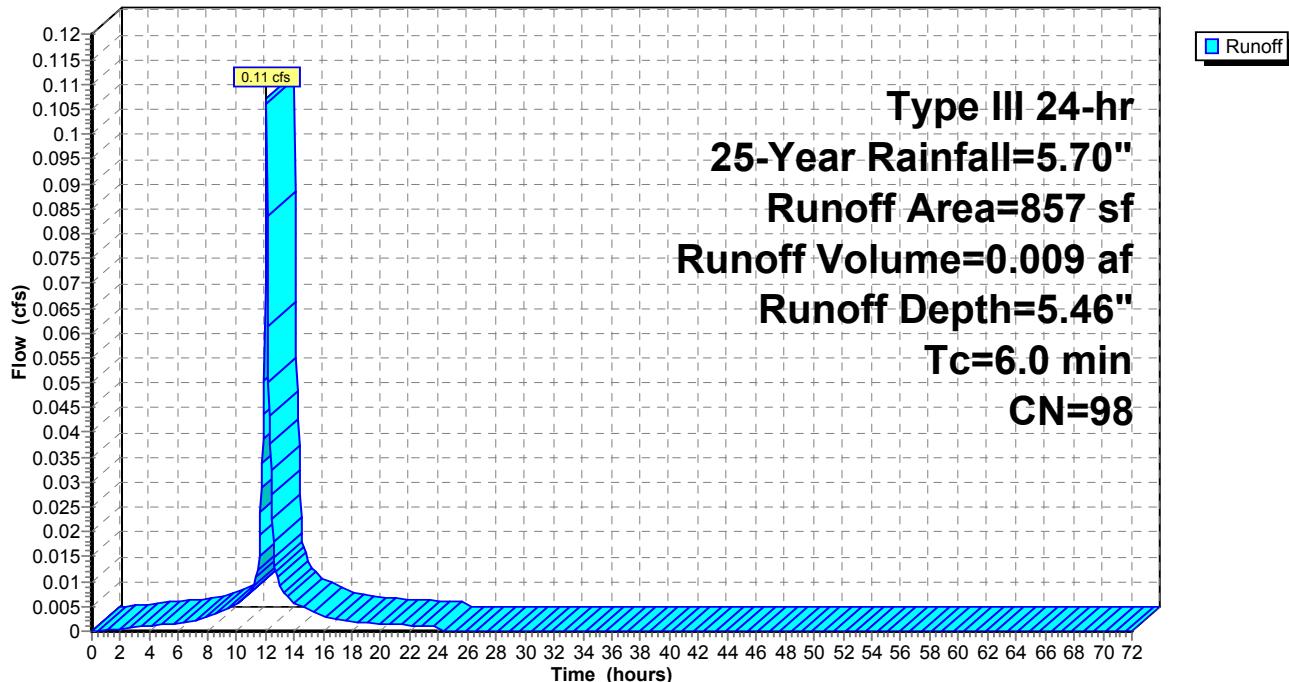
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
857	98	Roofs, HSG A
857		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-10R: Roofs 15 B

Hydrograph



Summary for Subcatchment 3A-10R1: Roofs 15 F

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.46"

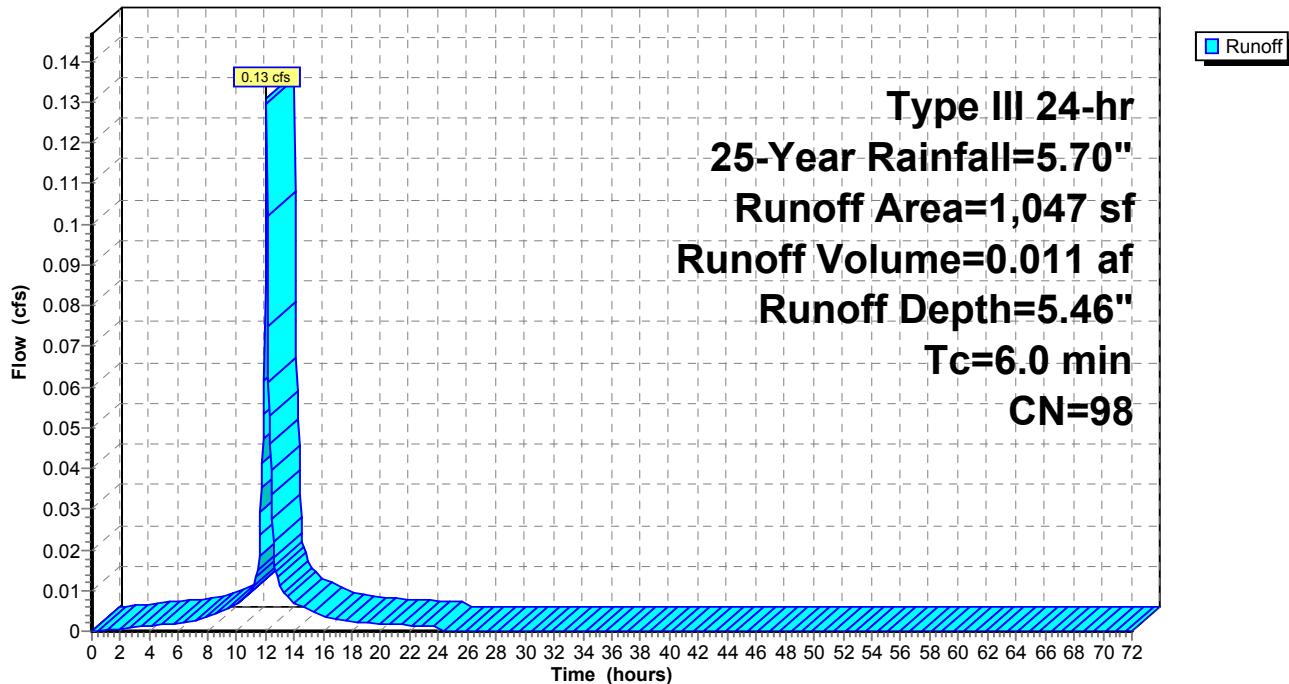
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
1,047	98	Roofs, HSG A
1,047		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-10R1: Roofs 15 F

Hydrograph



Summary for Subcatchment 3A-11R: Roofs 16-17 FB

Runoff = 0.48 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 5.46"

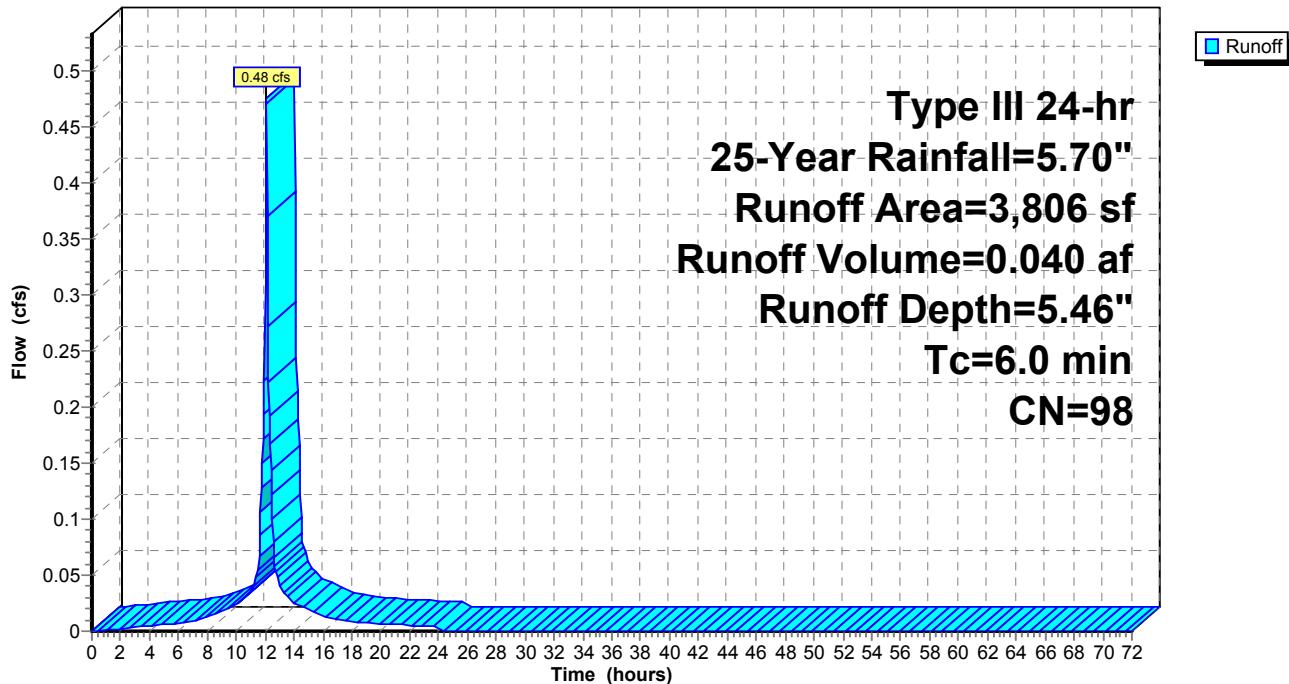
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
3,806	98	Roofs, HSG A
3,806		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-11R: Roofs 16-17 FB

Hydrograph



Summary for Subcatchment 3A-12R: Roofs 18-21 F

Runoff = 0.53 cfs @ 12.09 hrs, Volume= 0.044 af, Depth= 5.46"

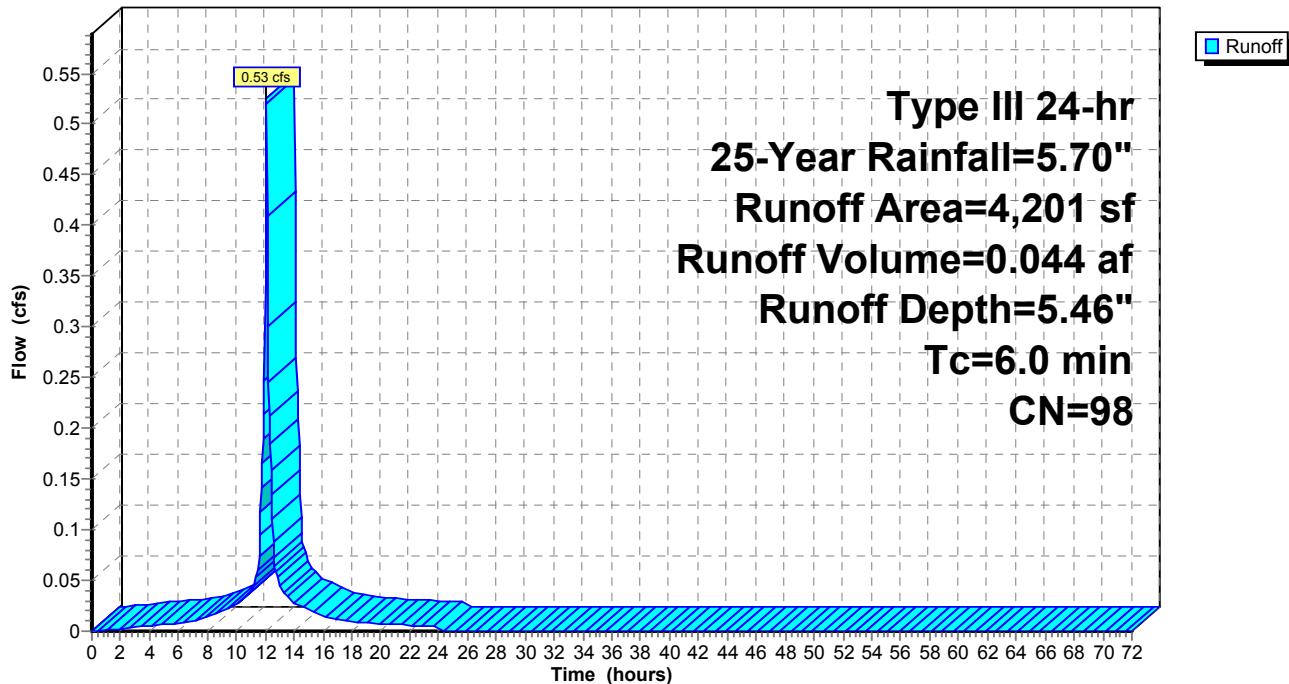
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
4,201	98	Roofs, HSG A
4,201		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-12R: Roofs 18-21 F

Hydrograph



Summary for Subcatchment 3A-12R1: Roofs 22-24 F

Runoff = 0.39 cfs @ 12.09 hrs, Volume= 0.033 af, Depth= 5.46"

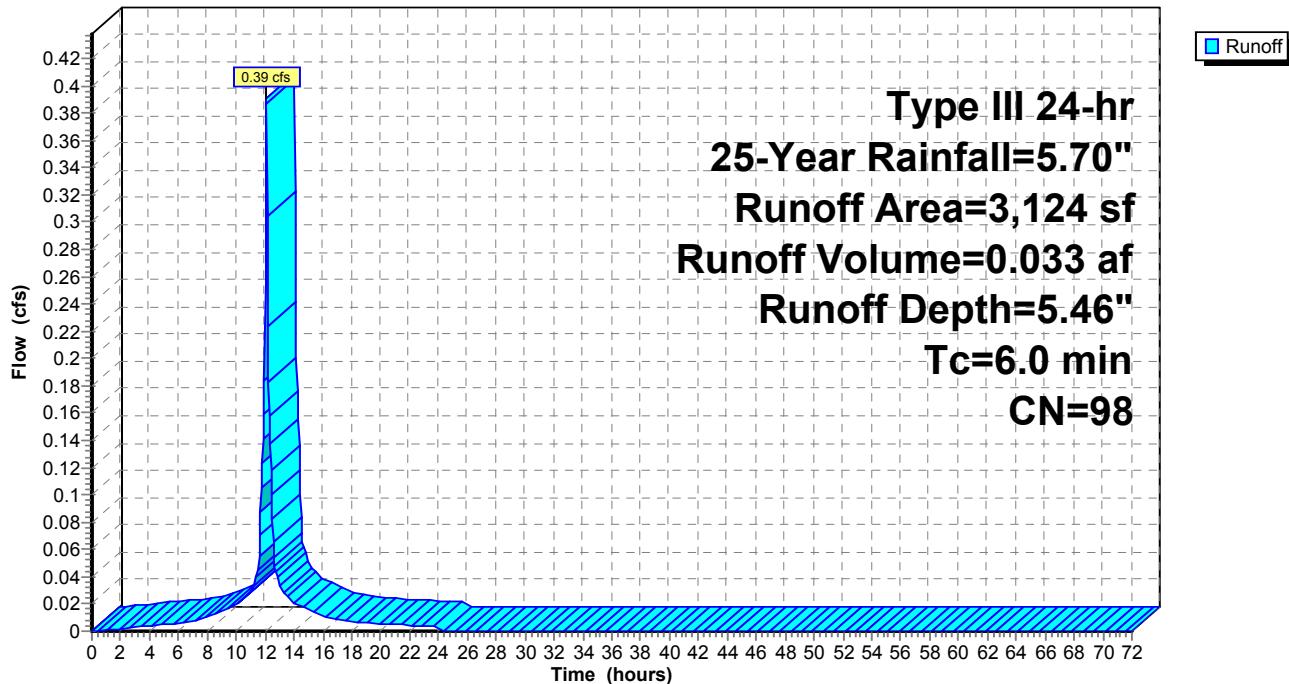
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
3,124	98	Roofs, HSG A
3,124		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-12R1: Roofs 22-24 F

Hydrograph



Summary for Subcatchment 3A-14R: Roofs 25-28 F

Runoff = 0.52 cfs @ 12.09 hrs, Volume= 0.043 af, Depth= 5.46"

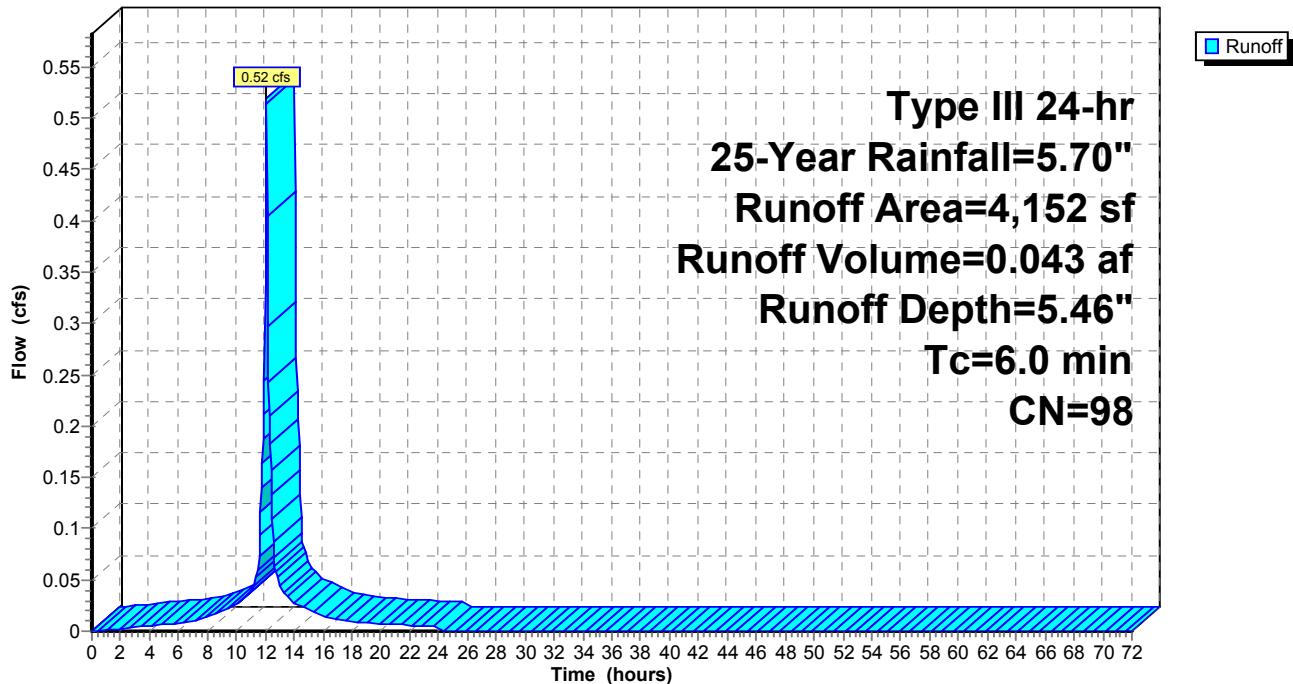
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
4,152	98	Roofs, HSG A
4,152		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R: Roofs 25-28 F

Hydrograph



Summary for Subcatchment 3A-14R1: Roofs 29-30 B

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af, Depth= 5.46"

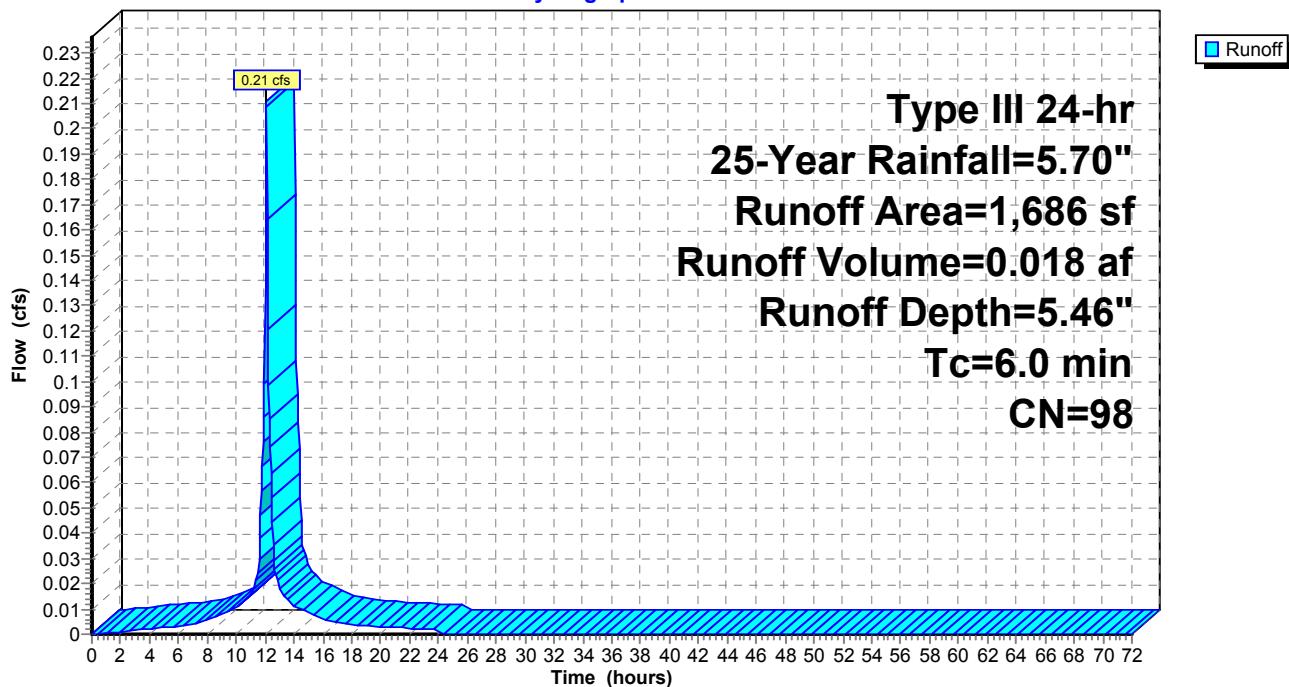
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
1,686	98	Roofs, HSG A
1,686		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R1: Roofs 29-30 B

Hydrograph



Summary for Subcatchment 3A-14R2: Roofs 31-32 B

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af, Depth= 5.46"

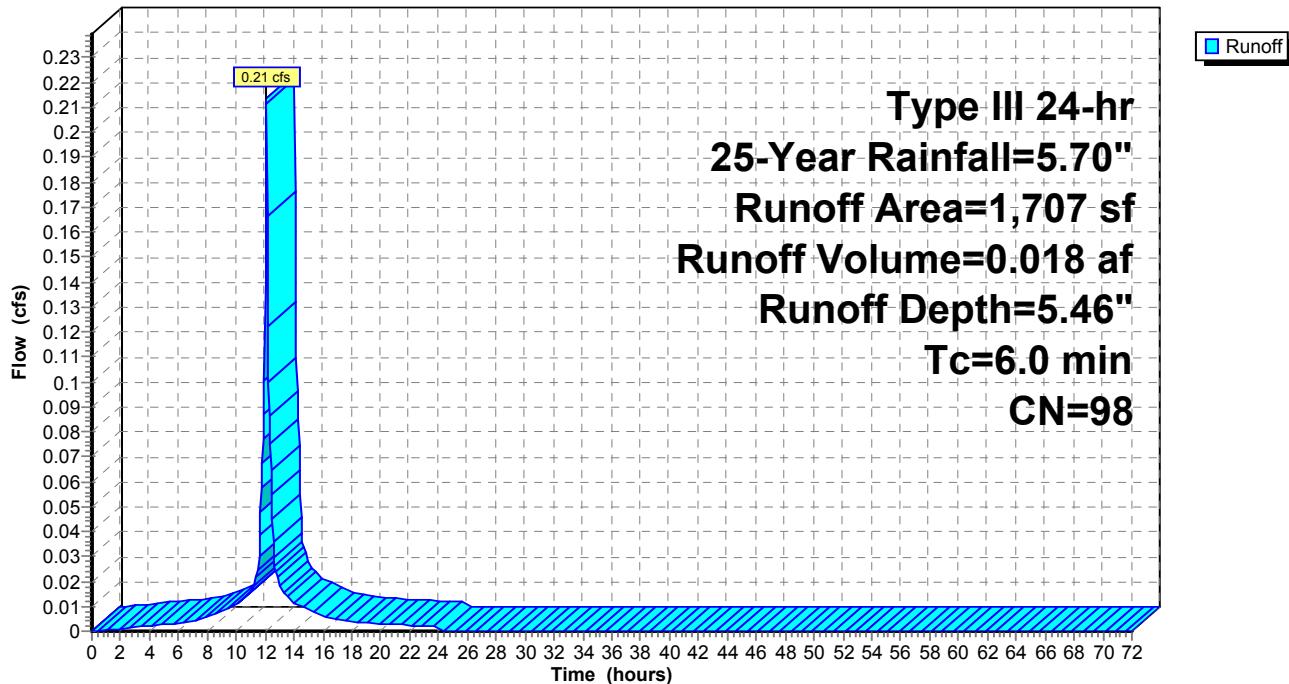
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
1,707	98	Roofs, HSG A
1,707		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R2: Roofs 31-32 B

Hydrograph



Summary for Subcatchment 3A-15R: Roofs 29-30 F

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.46"

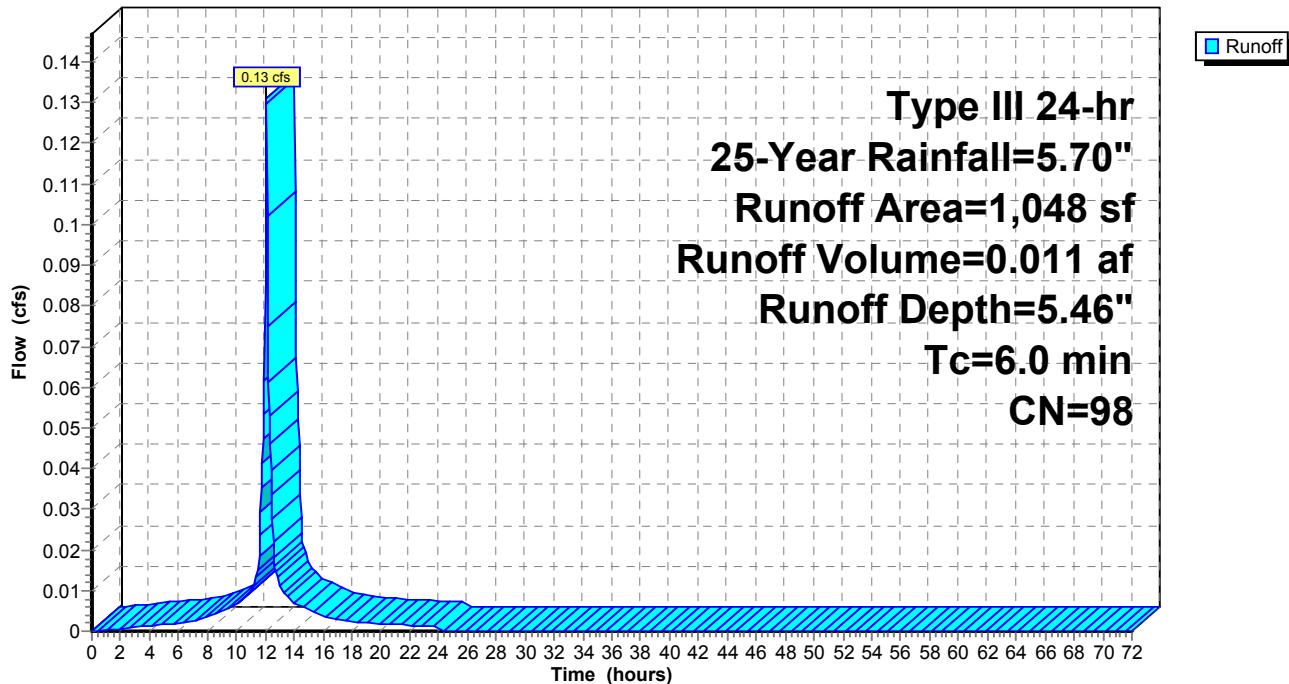
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
1,048	98	Roofs, HSG A
1,048		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-15R: Roofs 29-30 F

Hydrograph



Summary for Subcatchment 3A-16R: Roofs 29-30 F

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.46"

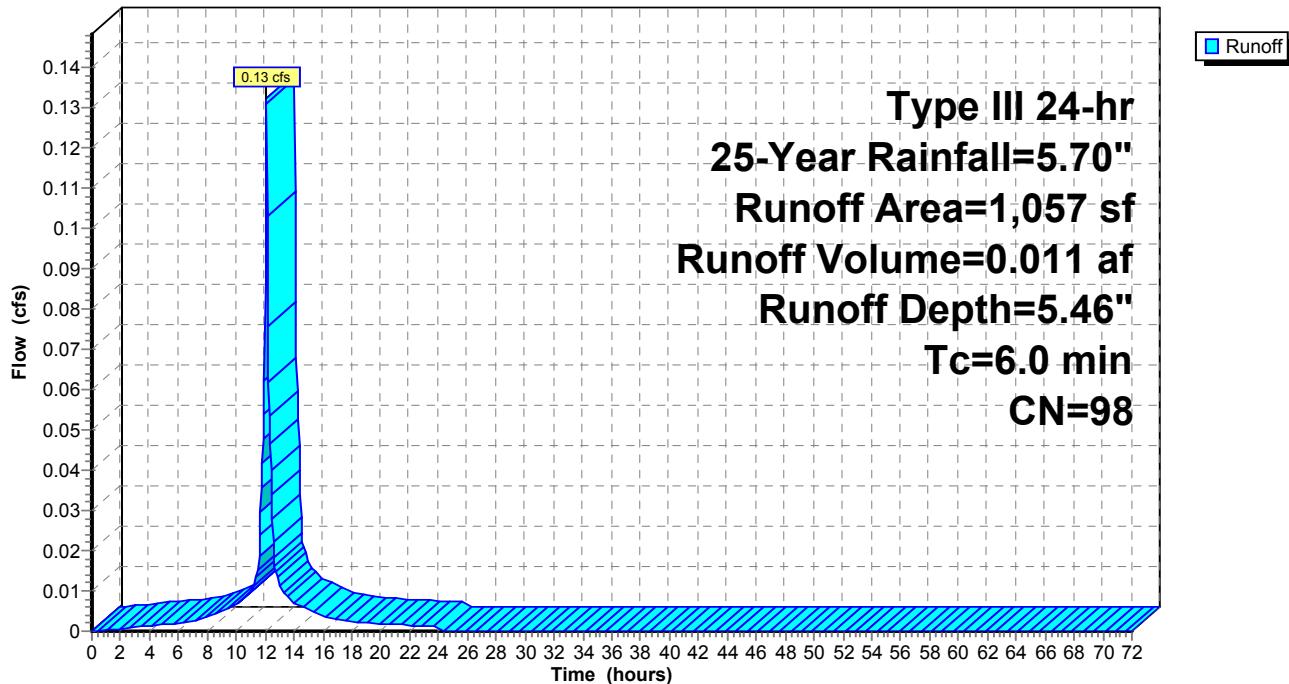
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
1,057	98	Roofs, HSG A
1,057		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-16R: Roofs 29-30 F

Hydrograph



Summary for Subcatchment 3A-17R: Roofs 31-32 F

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.46"

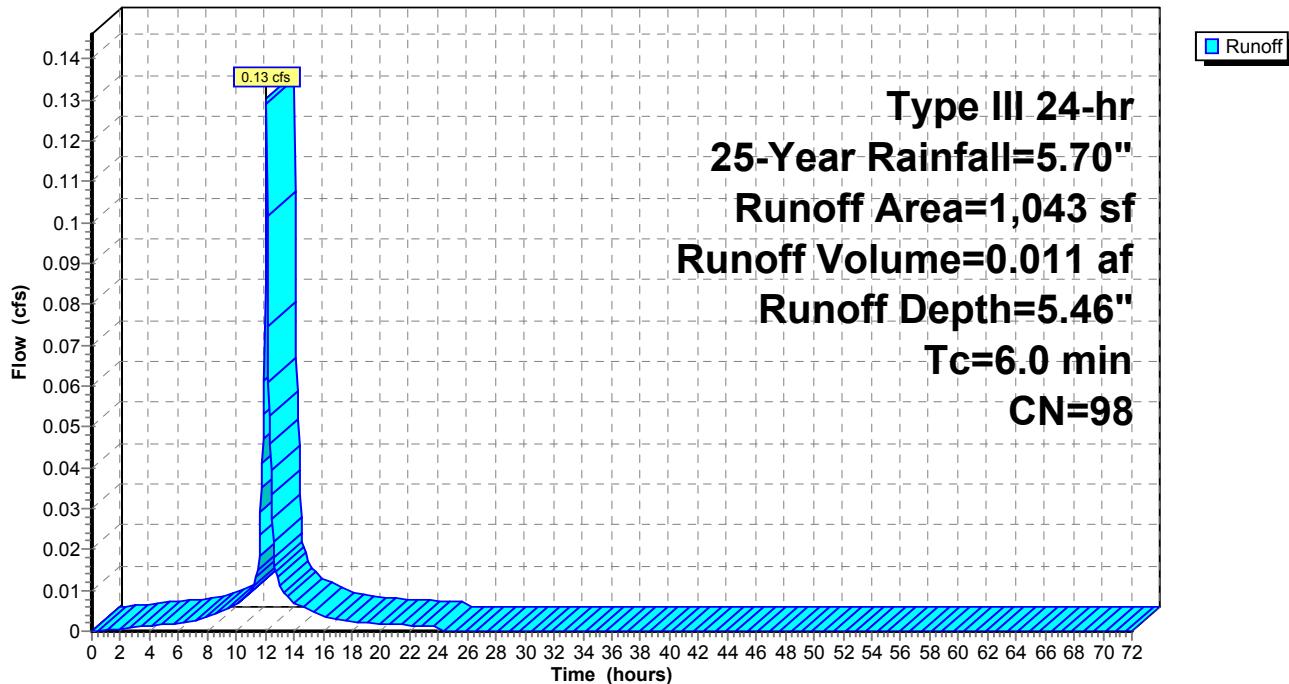
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
1,043	98	Roofs, HSG A
1,043		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-17R: Roofs 31-32 F

Hydrograph



Summary for Subcatchment 3A-18R: Roofs 31-32 F

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.46"

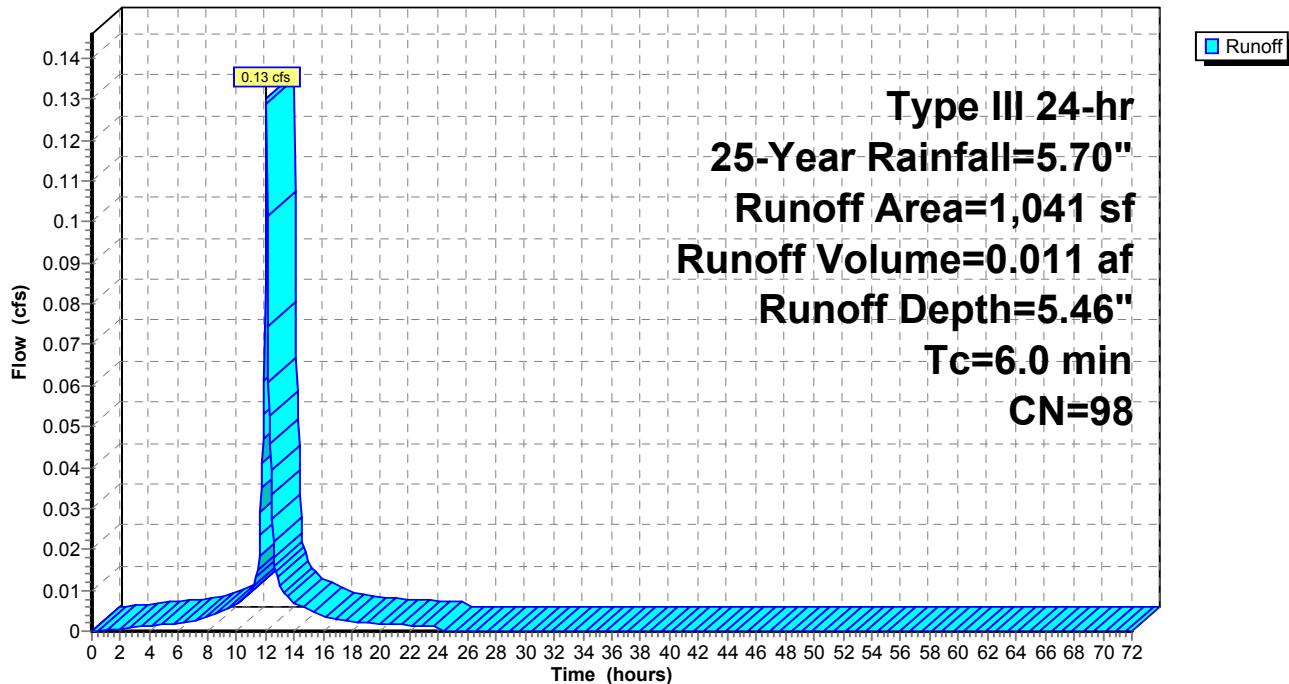
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
1,041	98	Roofs, HSG A
1,041		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-18R: Roofs 31-32 F

Hydrograph



Summary for Subcatchment 3A-1R: Roof 5

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.020 af, Depth= 5.46"

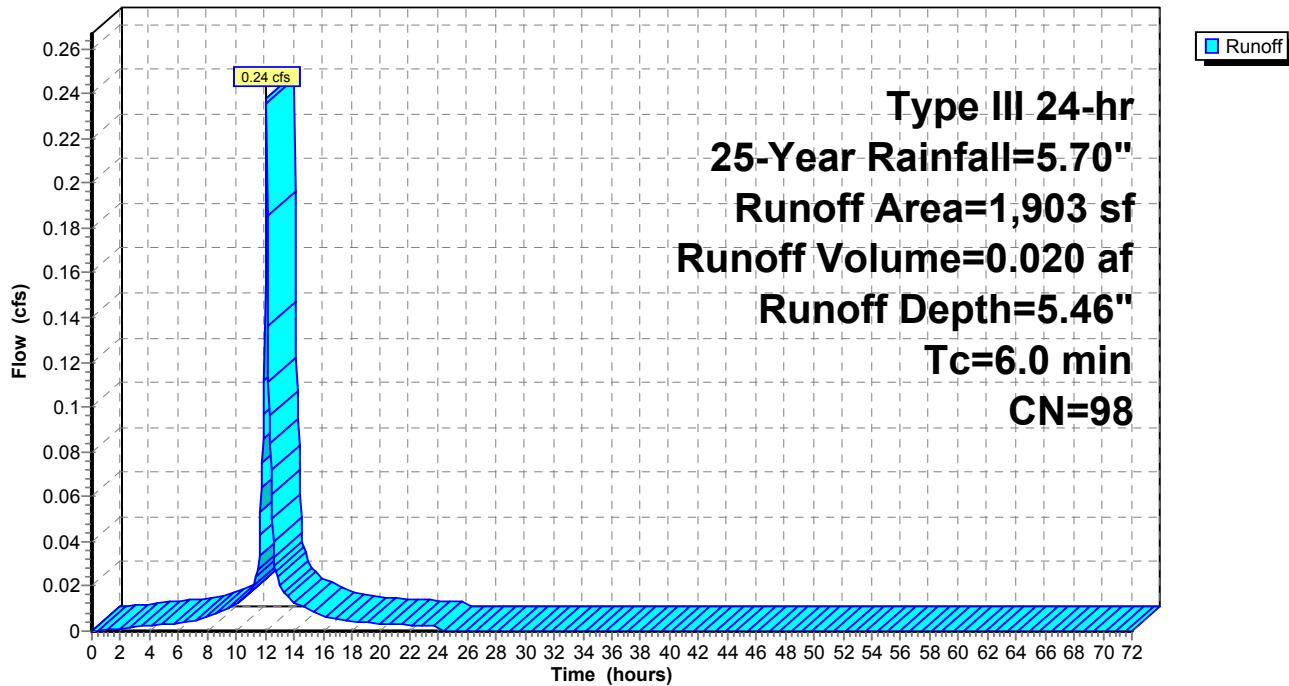
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
690	98	Roofs, HSG A
*	1,213	Roofs, HSG B
1,903	98	Weighted Average
1,903		100.00% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 3A-1R: Roof 5

Hydrograph



Summary for Subcatchment 3A-2R: Roofs 1-4 FB

Runoff = 0.95 cfs @ 12.09 hrs, Volume= 0.080 af, Depth= 5.46"

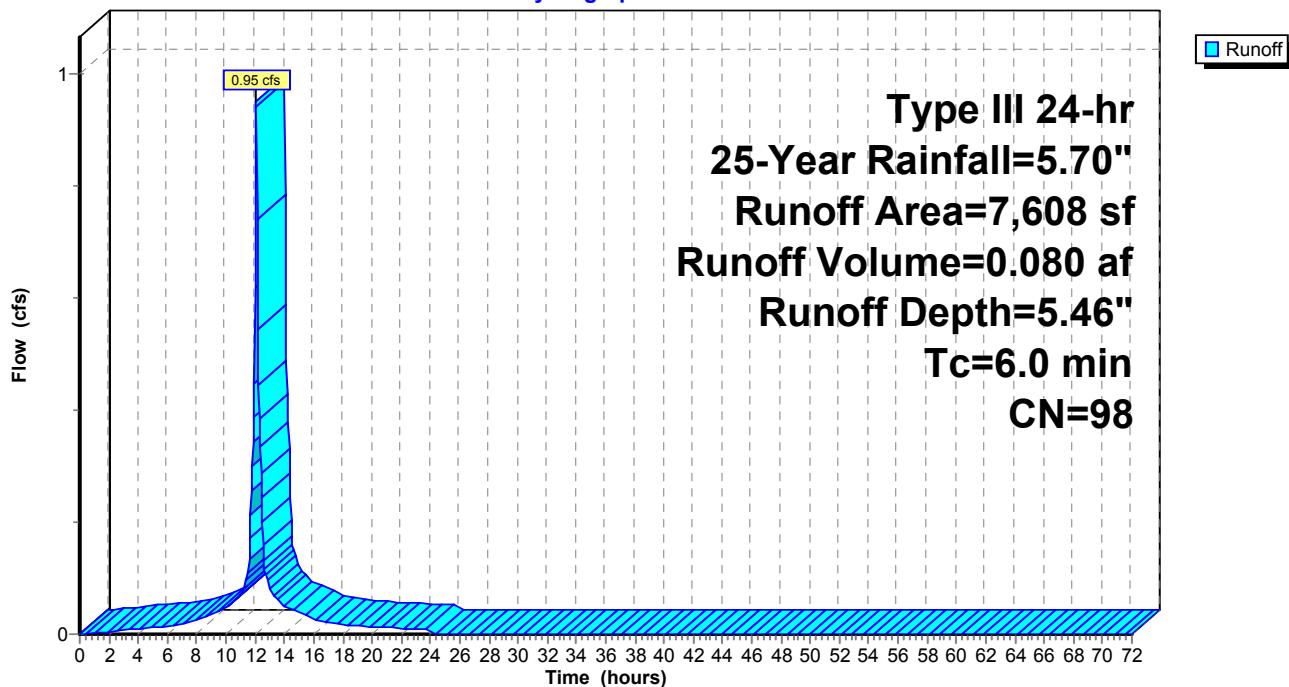
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
7,608	98	Roofs, HSG A
7,608		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-2R: Roofs 1-4 FB

Hydrograph



Summary for Subcatchment 3A-2R1: Roofs 6-9 FB

Runoff = 0.95 cfs @ 12.09 hrs, Volume= 0.080 af, Depth= 5.46"

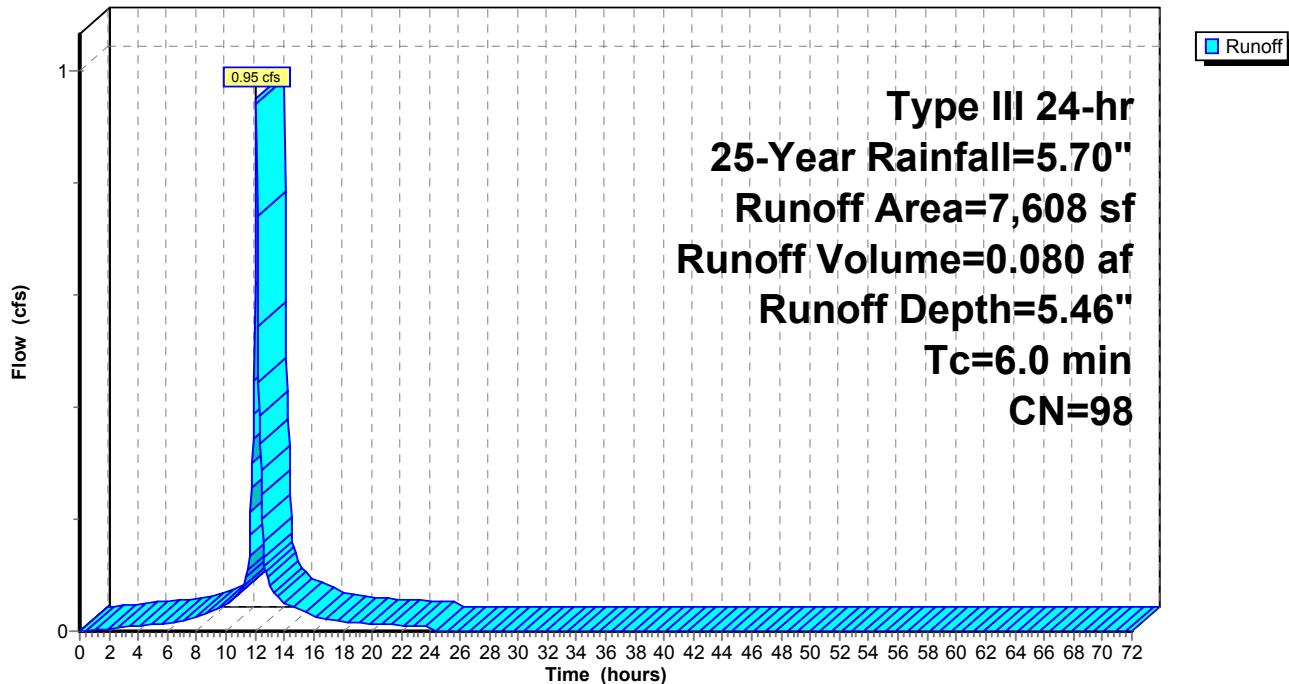
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
7,608	98	Roofs, HSG A
7,608		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-2R1: Roofs 6-9 FB

Hydrograph



Summary for Subcatchment 3A-3R: Roofs 10-F

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.46"

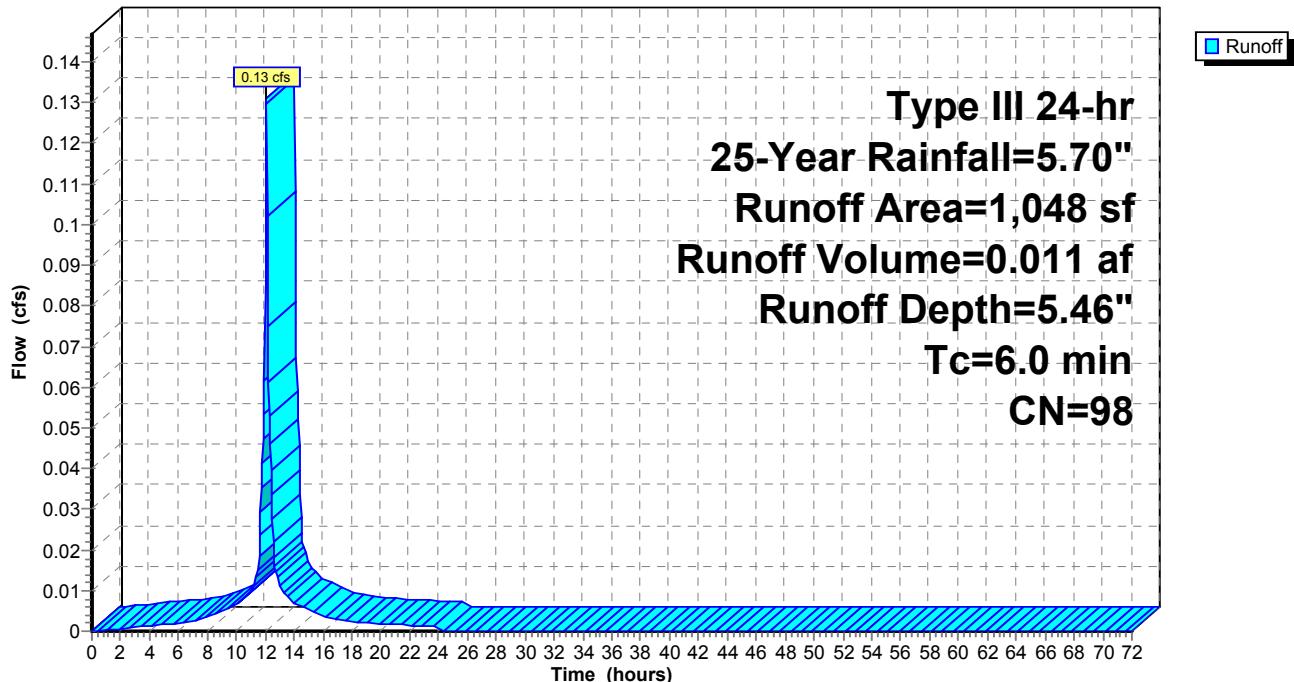
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
*	1,048	98 Roofs, HSG B
	1,048	100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-3R: Roofs 10-F

Hydrograph



Summary for Subcatchment 3A-4R: Roofs 11 F

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.46"

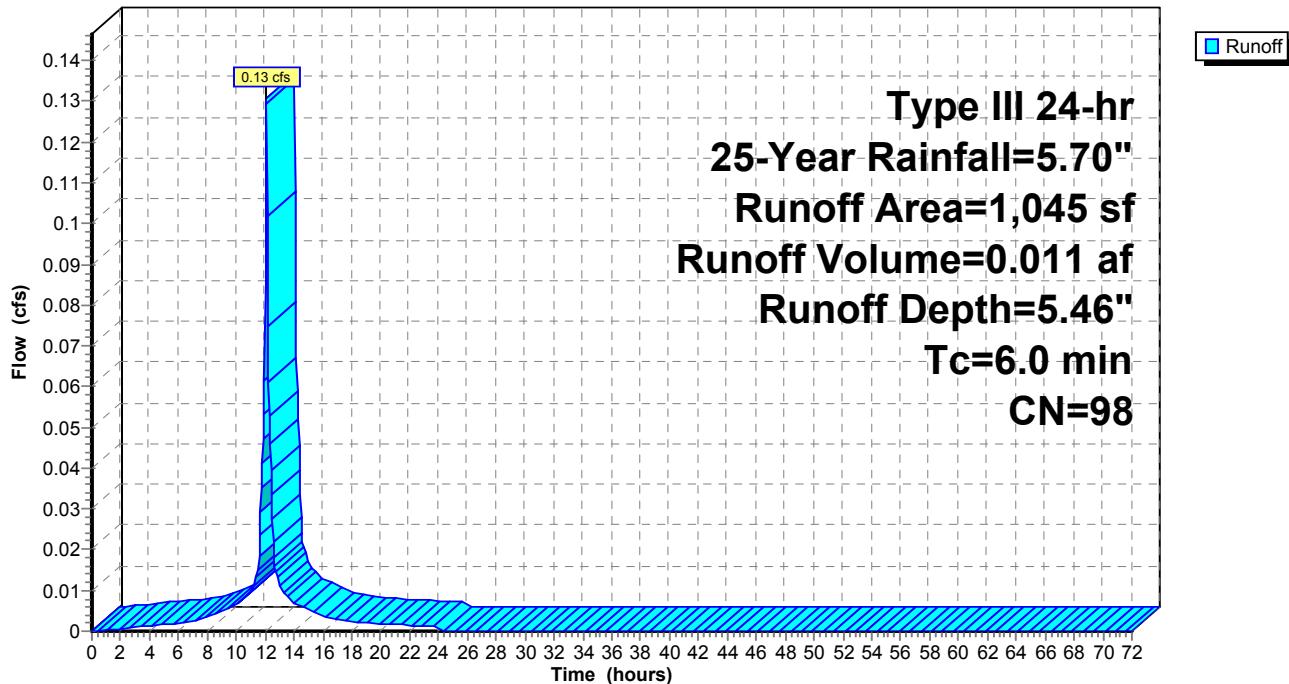
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
*		
1,045	98	Roofs, HSG B
1,045		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0				Direct Entry,	

Subcatchment 3A-4R: Roofs 11 F

Hydrograph



Summary for Subcatchment 3A-5R: Roofs 10-11 B

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af, Depth= 5.46"

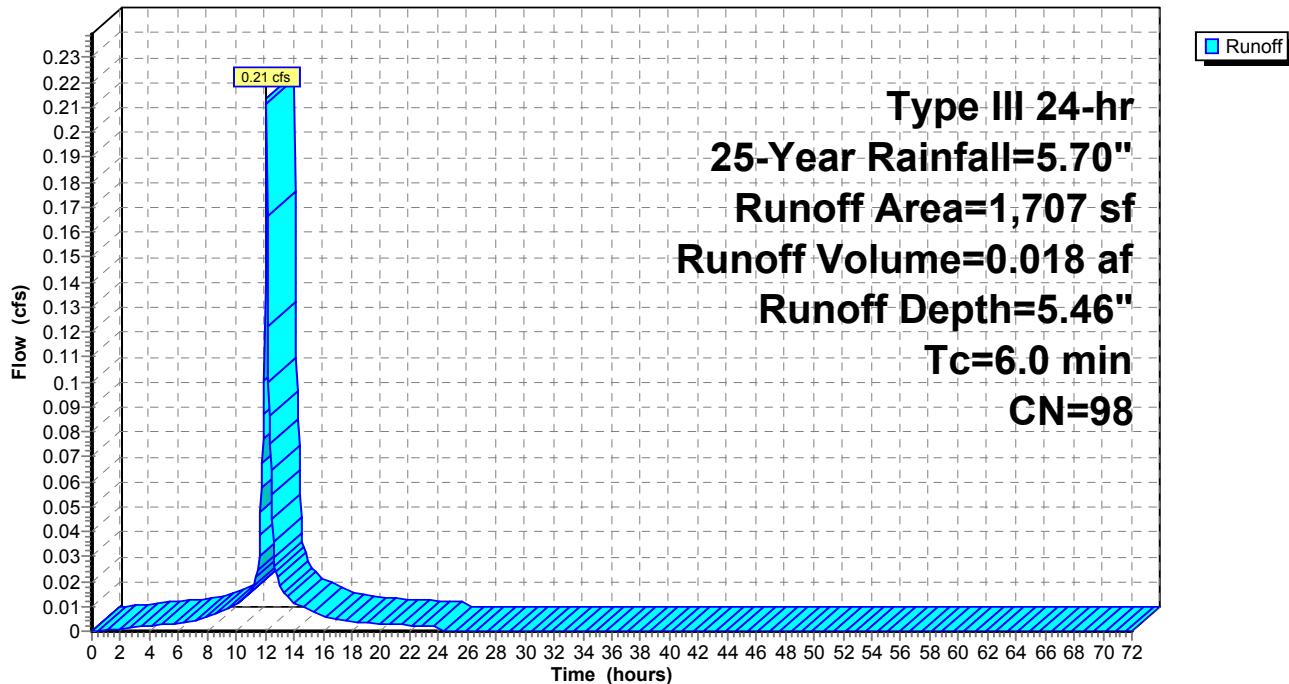
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
* 1,707	98	Roofs, HSG B
1,707		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-5R: Roofs 10-11 B

Hydrograph



Summary for Subcatchment 3A-6R: Roofs 12 B

Runoff = 0.10 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 5.46"

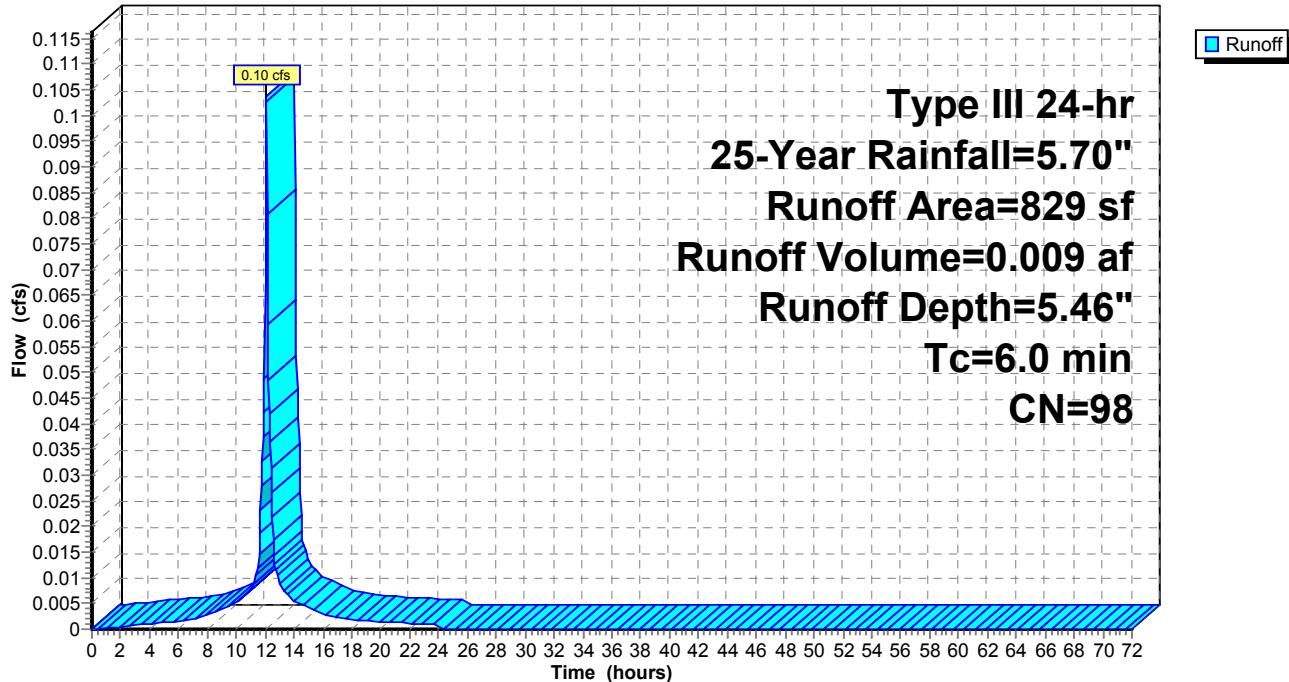
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

	Area (sf)	CN	Description
*	829	98	Roofs, HSG B
	829		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-6R: Roofs 12 B

Hydrograph



Summary for Subcatchment 3A-7R: Roofs 12 F

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.46"

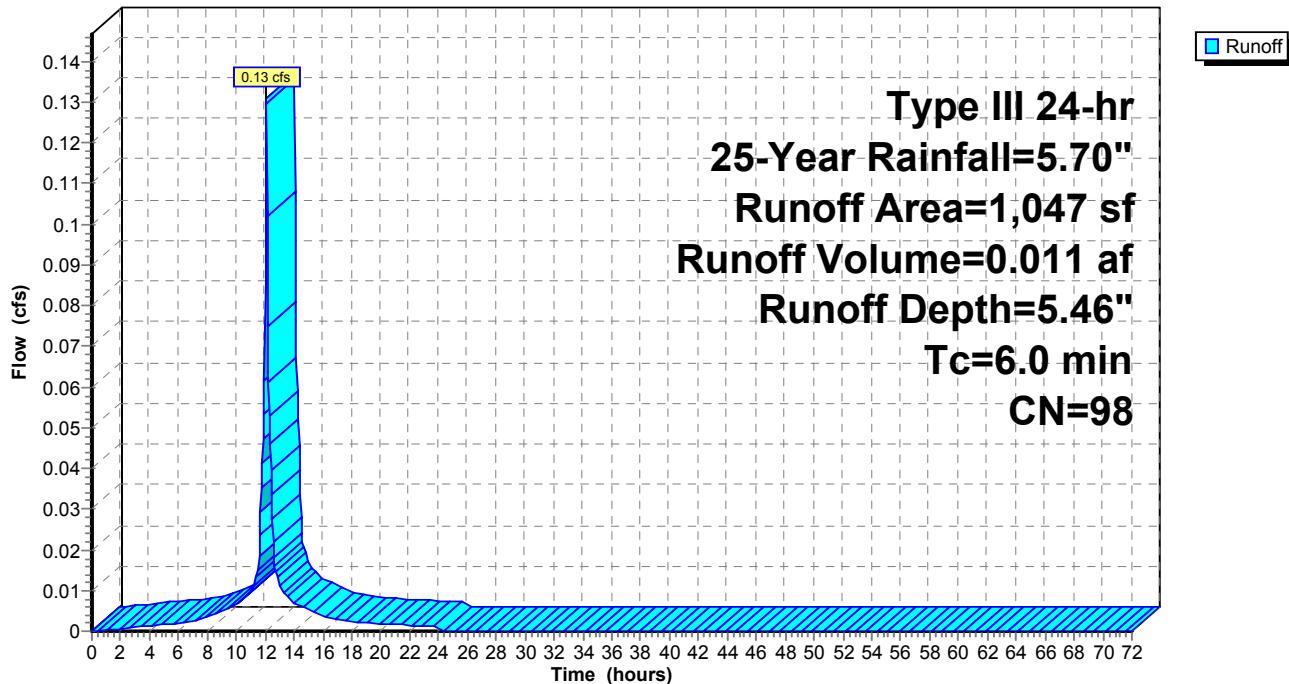
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
*		
1,047	98	Roofs, HSG B
1,047		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0				Direct Entry,	

Subcatchment 3A-7R: Roofs 12 F

Hydrograph



Summary for Subcatchment 3A-8R: Roofs 13 F

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.46"

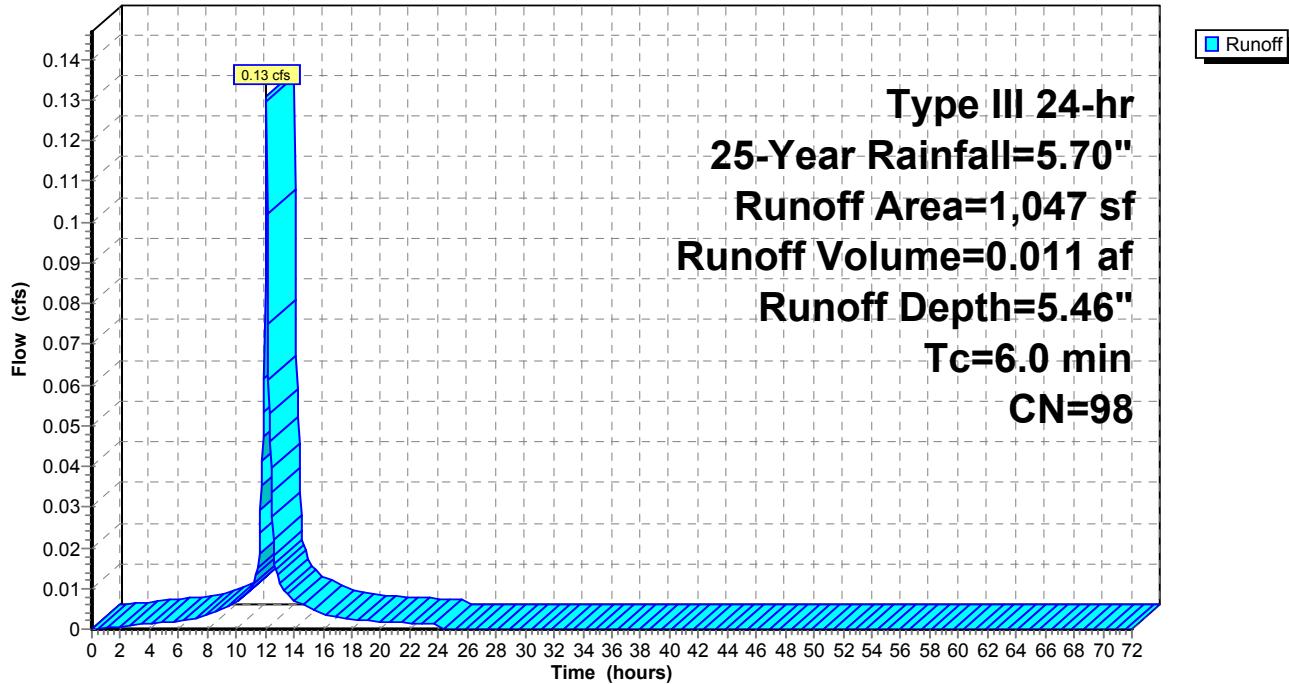
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
80	98	Roofs, HSG A
*	967	Roofs, HSG B
1,047	98	Weighted Average
1,047		100.00% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 3A-8R: Roofs 13 F

Hydrograph



Summary for Subcatchment 3A-9R: Roofs 14 F

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.46"

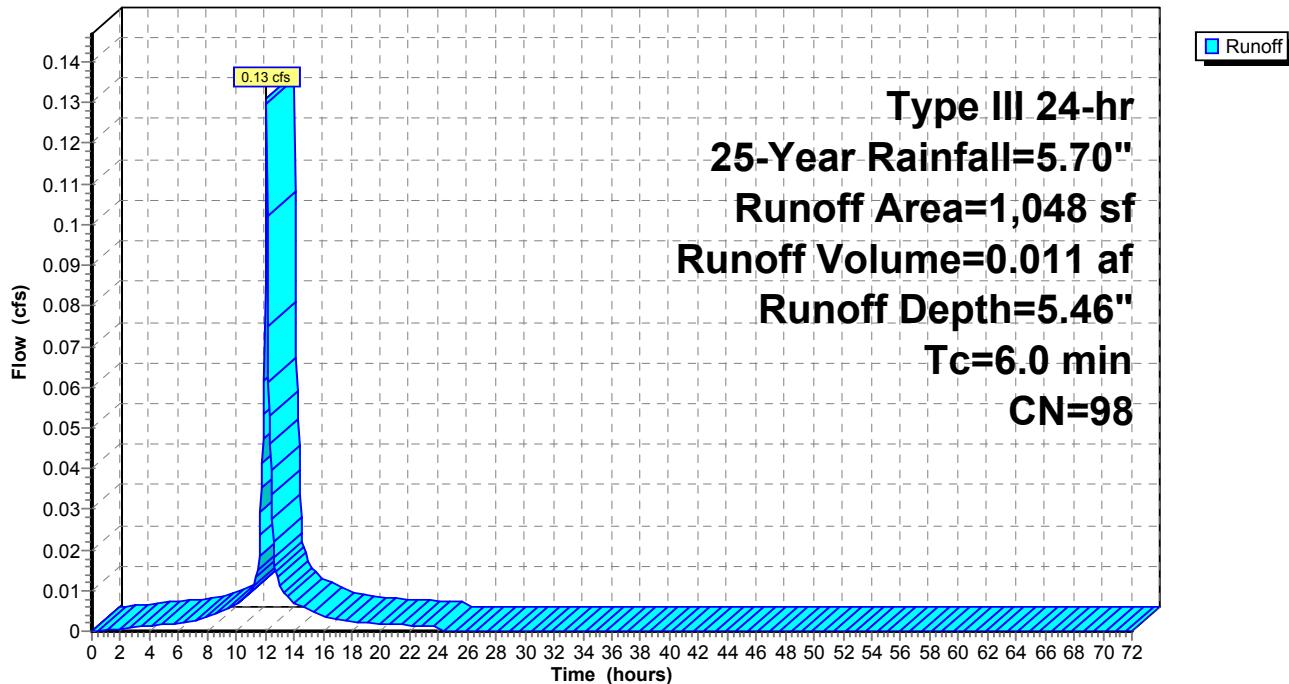
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
1,048	98	Roofs, HSG A
1,048		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-9R: Roofs 14 F

Hydrograph



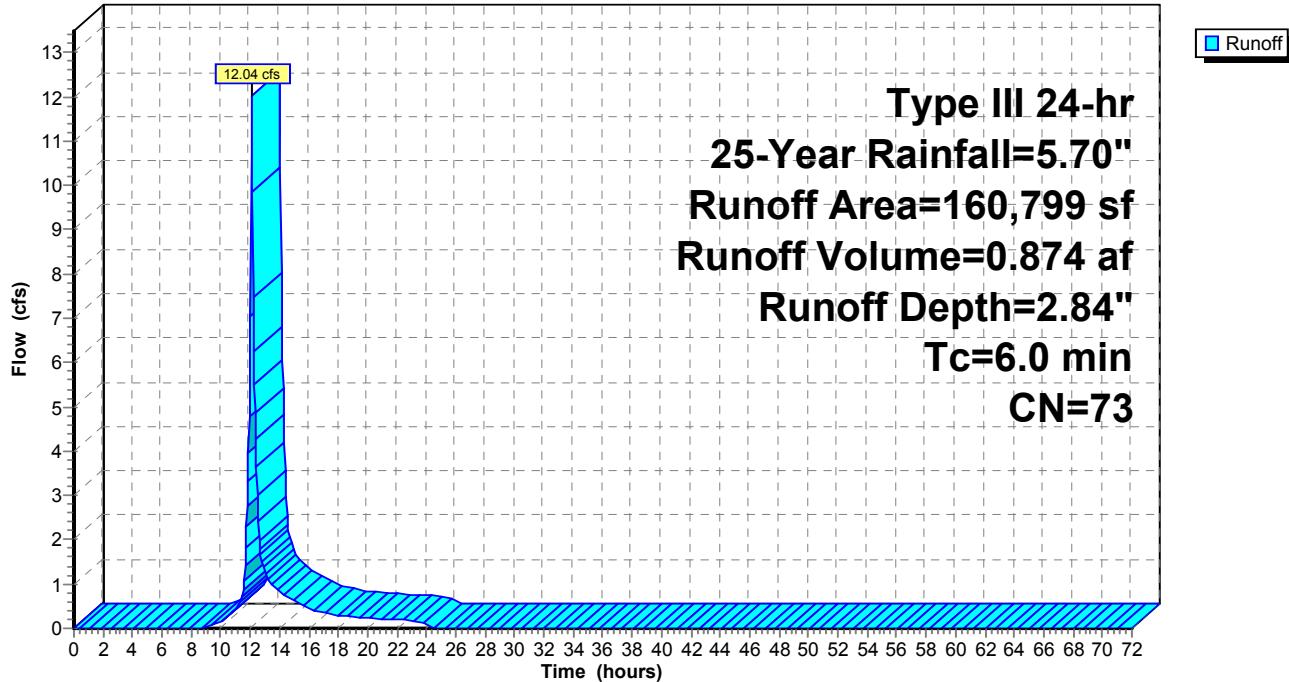
Summary for Subcatchment 3A-S: Sub-3A

Runoff = 12.04 cfs @ 12.09 hrs, Volume= 0.874 af, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
*	14,912	Paved drives, HSG A
*	2,050	Paved drives, HSG B
*	21,695	Paved roads w/curbs & sewers, HSG A
	8,853	Paved roads w/curbs & sewers, HSG B
*	3,012	Paved sidewalk, HSG A
*	986	Paved sidewalk. HSG B
*	1,189	Walks, HSG A
*	170	Walks, HSG B
*	922	Roofs, HSG A
*	874	Roofs, HSG B
*	2,352	Decks, HSG A
*	77	Decks, HSG B
*	7,626	Detention Basin, HSG A
*	4,140	Detention Basin, HSG B
55,493	39	>75% Grass cover, Good, HSG A
7,411	61	>75% Grass cover, Good, HSG B
2,714	98	Paved roads w/curbs & sewers, HSG A
*	474	Paved sidewalk, HSG A
*	103	Walls, HSG A
2,697	39	>75% Grass cover, Good, HSG A
*	1,384	Roofs, HSG A - offsite
16,069	98	Paved parking, HSG A - offsite
*	914	>75% Grass cover, Good, HSG A - offsite
*	1,682	Woods, Good, HSG A - offsite
*	3,000	Woods, Good, HSG A - offsite
160,799	73	Weighted Average
71,197		44.28% Pervious Area
89,602		55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

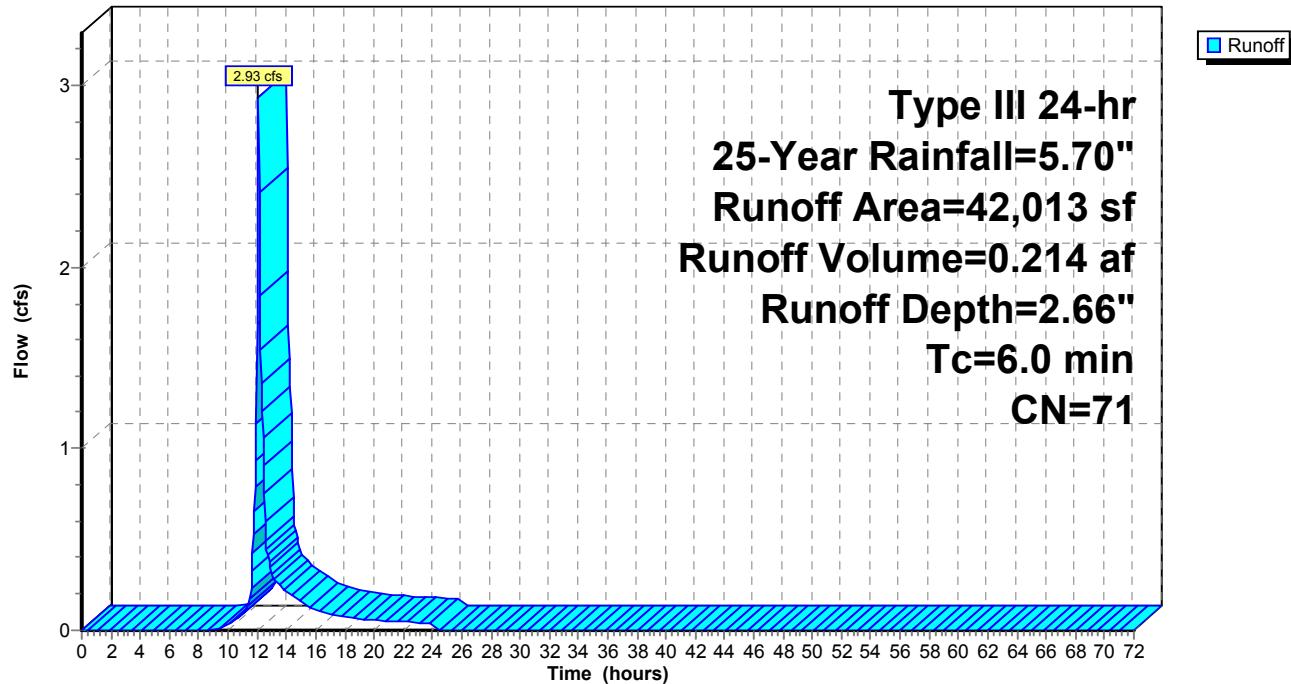
Subcatchment 3A-S: Sub-3A**Hydrograph**

Summary for Subcatchment 3B-S: Sub-3B

Runoff = 2.93 cfs @ 12.10 hrs, Volume= 0.214 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description		
10,864	55	Woods, Good, HSG B		
1,423	30	Woods, Good, HSG A		
*	15,816	Wetlands, HSG B		
1,532	39	>75% Grass cover, Good, HSG A		
7,195	61	>75% Grass cover, Good, HSG B		
*	0	Roofs, HSG B		
*	666	Decks, HSG B		
*	418	Wetlands, HSG B - offsite		
*	62	Woods, Good, HSG A - offsite		
*	1,346	>75% Grass cover, Good, HSG A - offsite		
*	957	>75% Grass cover, Good, HSG B - offsite		
*	1,734	Woods, Good, HSG B - offsite		
42,013	71	Weighted Average		
25,113		59.77% Pervious Area		
16,900		40.23% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description		
6.0				Direct Entry,

Subcatchment 3B-S: Sub-3B**Hydrograph**

Summary for Subcatchment 3C-S: Sub-3C

Runoff = 0.54 cfs @ 12.11 hrs, Volume= 0.044 af, Depth= 1.42"

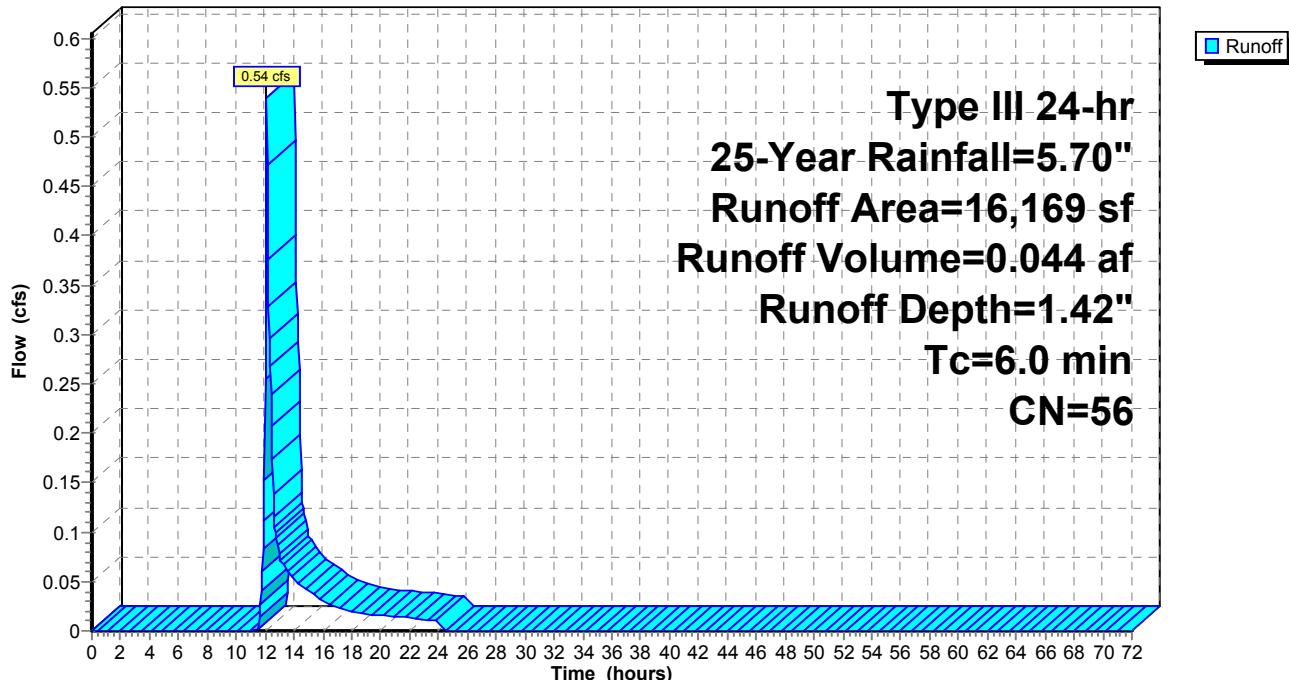
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

	Area (sf)	CN	Description
*	2,133	30	Woods, Good, HSG A - offsite
*	714	98	Paved roads w/curbs & sewers, HSG A - offsite
*	290	98	Paved drives, HSG A - offsite
*	2,061	39	>75% Grass cover, Good, HSG A - offsite
	4,666	61	>75% Grass cover, Good, HSG B
	4,041	39	>75% Grass cover, Good, HSG A
*	234	98	Paved sidewalk, HSG B
*	77	98	Paved sidewalk, HSG A
	1,600	98	Paved roads w/curbs & sewers, HSG B
*	75	98	Decks, HSG B
	278	98	Paved roads w/curbs & sewers, HSG A
	16,169	56	Weighted Average
	12,901		79.79% Pervious Area
	3,268		20.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 3C-S: Sub-3C

Hydrograph



Summary for Subcatchment 4S-1: Sub-4

Runoff = 0.53 cfs @ 12.10 hrs, Volume= 0.041 af, Depth= 1.81"

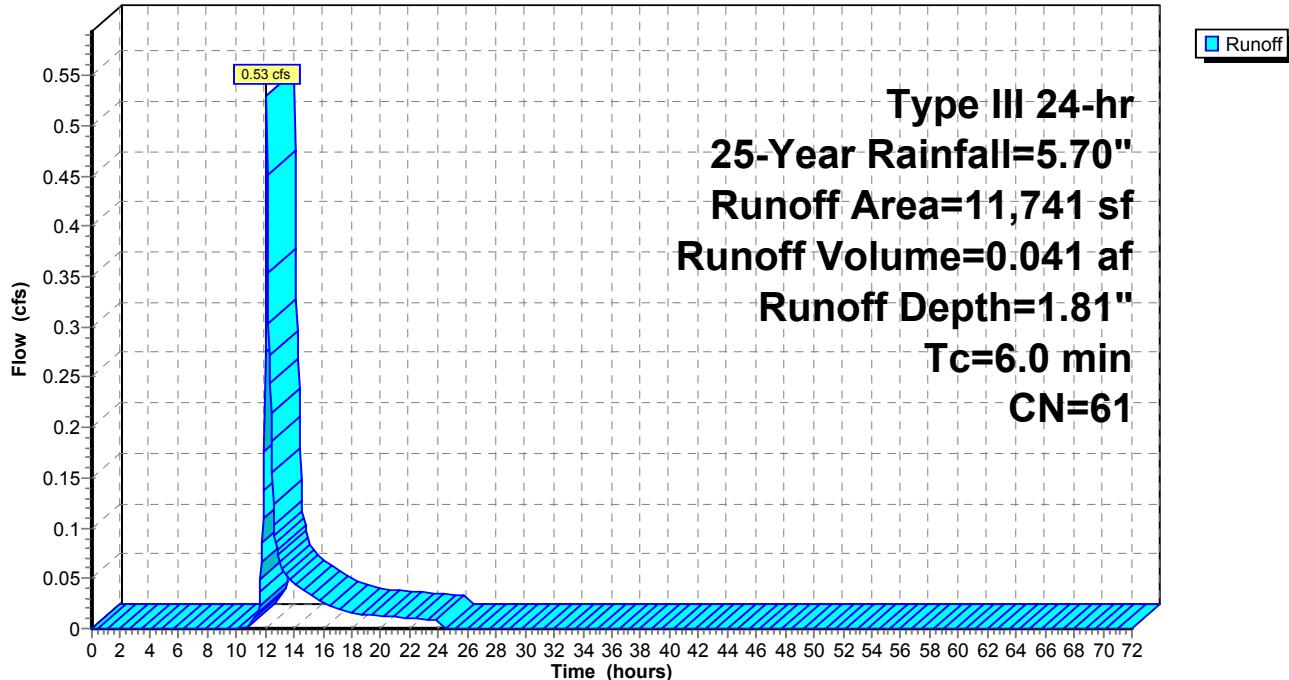
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
6,586	39	>75% Grass cover, Good, HSG A
* 942	98	Decks, HSG A
3,456	98	Roofs, HSG A
757	39	>75% Grass cover, Good, HSG A
11,741	61	Weighted Average
7,343		62.54% Pervious Area
4,398		37.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 4S-1: Sub-4

Hydrograph



Summary for Subcatchment 4S-1R: Roofs 22-24 B

Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.027 af, Depth= 5.46"

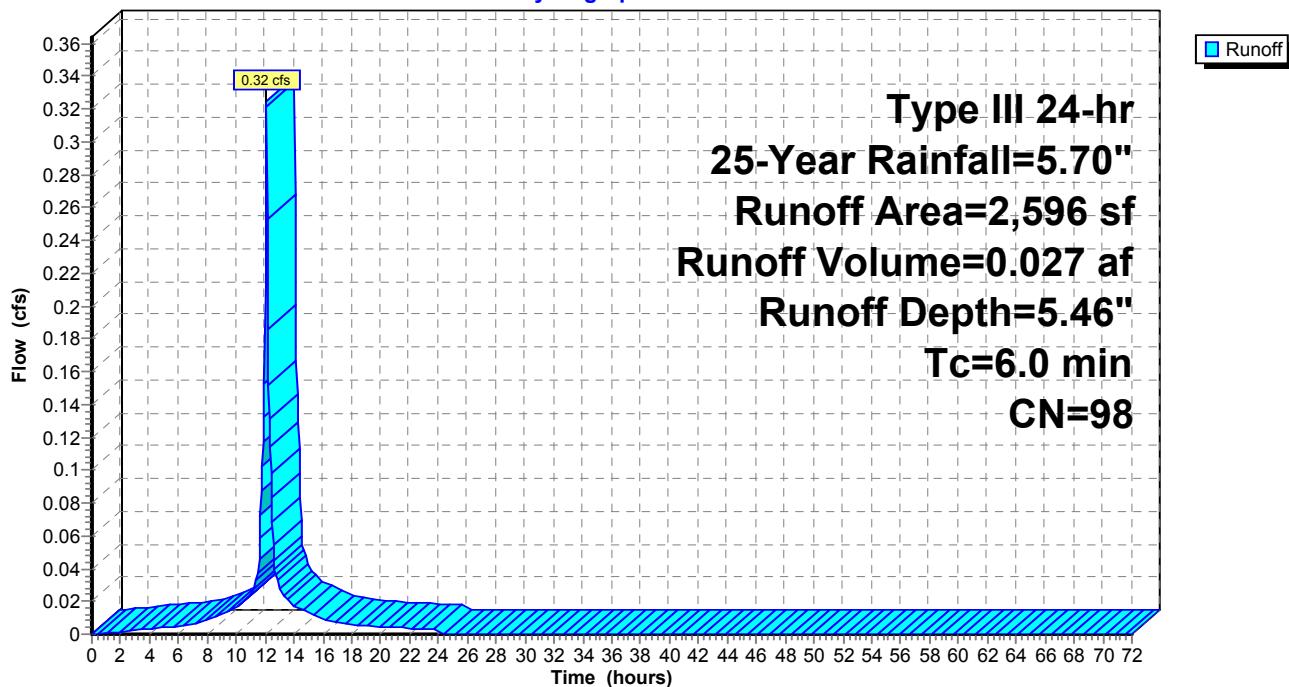
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
2,596	98	Roofs, HSG A
2,596		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 4S-1R: Roofs 22-24 B

Hydrograph



Summary for Subcatchment 4S-2: Sub-4

Runoff = 0.03 cfs @ 12.16 hrs, Volume= 0.004 af, Depth= 0.63"

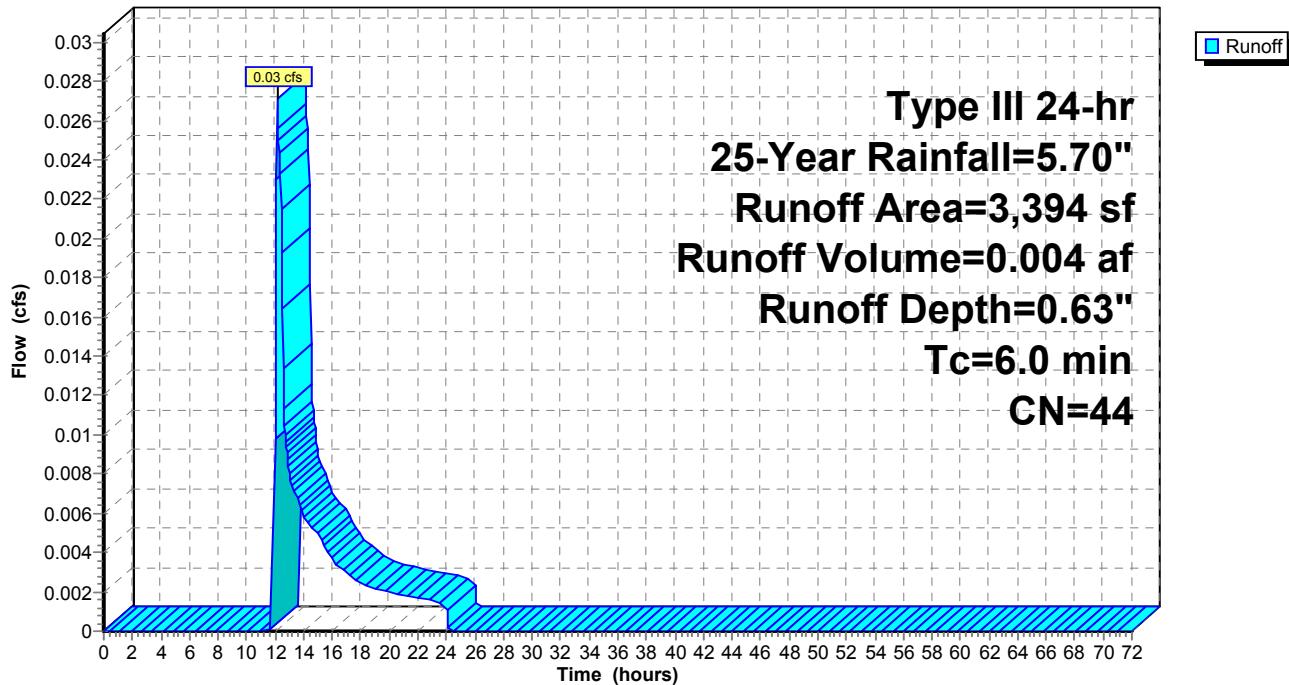
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
3,083	39	>75% Grass cover, Good, HSG A
*	185	Decks, HSG A
*	126	Walls, HSG A
3,394	44	Weighted Average
3,083		90.84% Pervious Area
311		9.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 4S-2: Sub-4

Hydrograph



Summary for Subcatchment 5S: Sub -5

Runoff = 0.13 cfs @ 12.15 hrs, Volume= 0.017 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

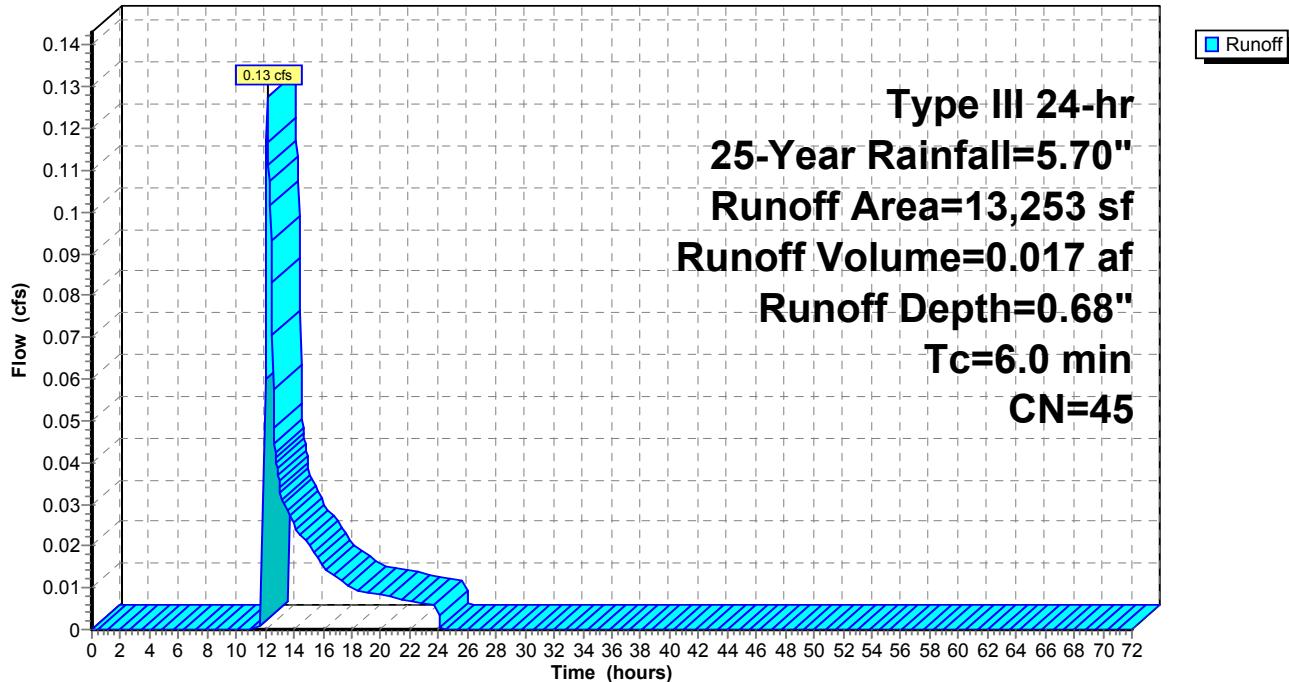
Area (sf)	CN	Description
11,396	39	>75% Grass cover, Good, HSG A
*	634	>75% Grass cover, Good, HSG D
*	14	Decks, HSG D
*	1,112	Decks, HSG A
*	40	Walls, HSG D
*	57	Walls, HSG A

13,253	45	Weighted Average
12,030		90.77% Pervious Area
1,223		9.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 5S: Sub -5

Hydrograph



Summary for Subcatchment 5S-1R: Roofs 18-21 B

Runoff = 0.43 cfs @ 12.09 hrs, Volume= 0.036 af, Depth= 5.46"

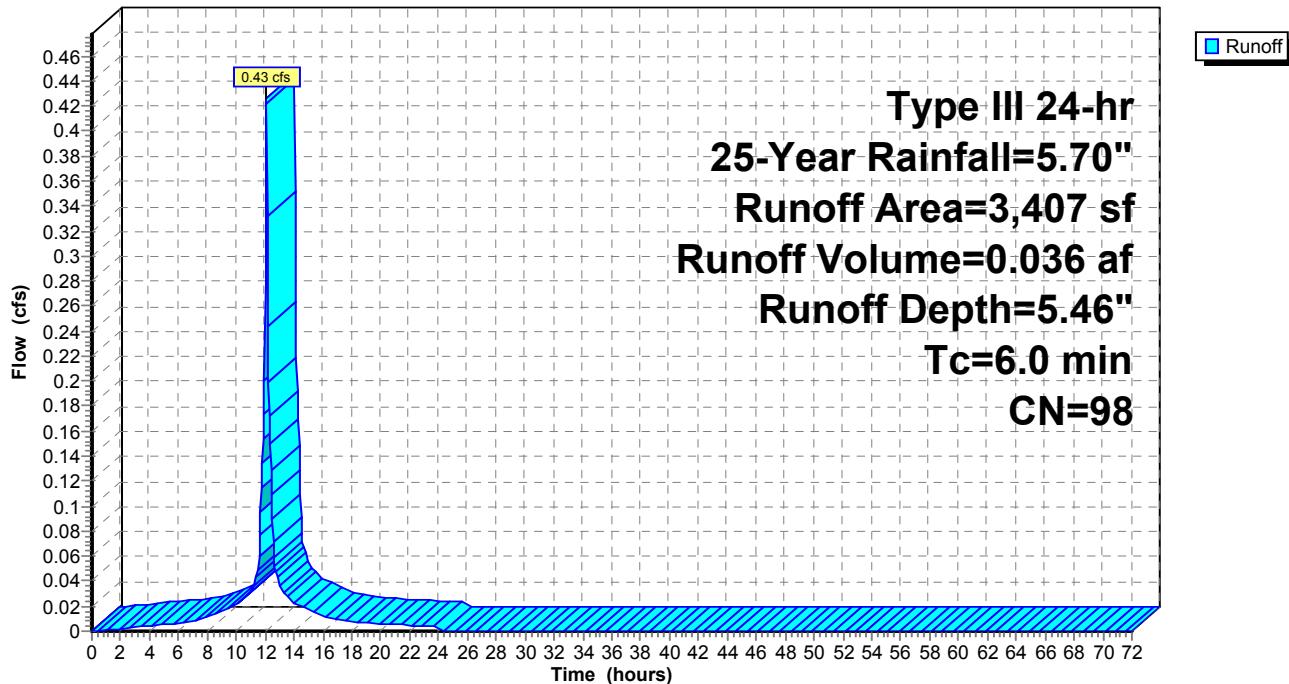
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.70"

Area (sf)	CN	Description
3,407	98	Roofs, HSG A
3,407		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 5S-1R: Roofs 18-21 B

Hydrograph



Summary for Reach DP-1: DMH

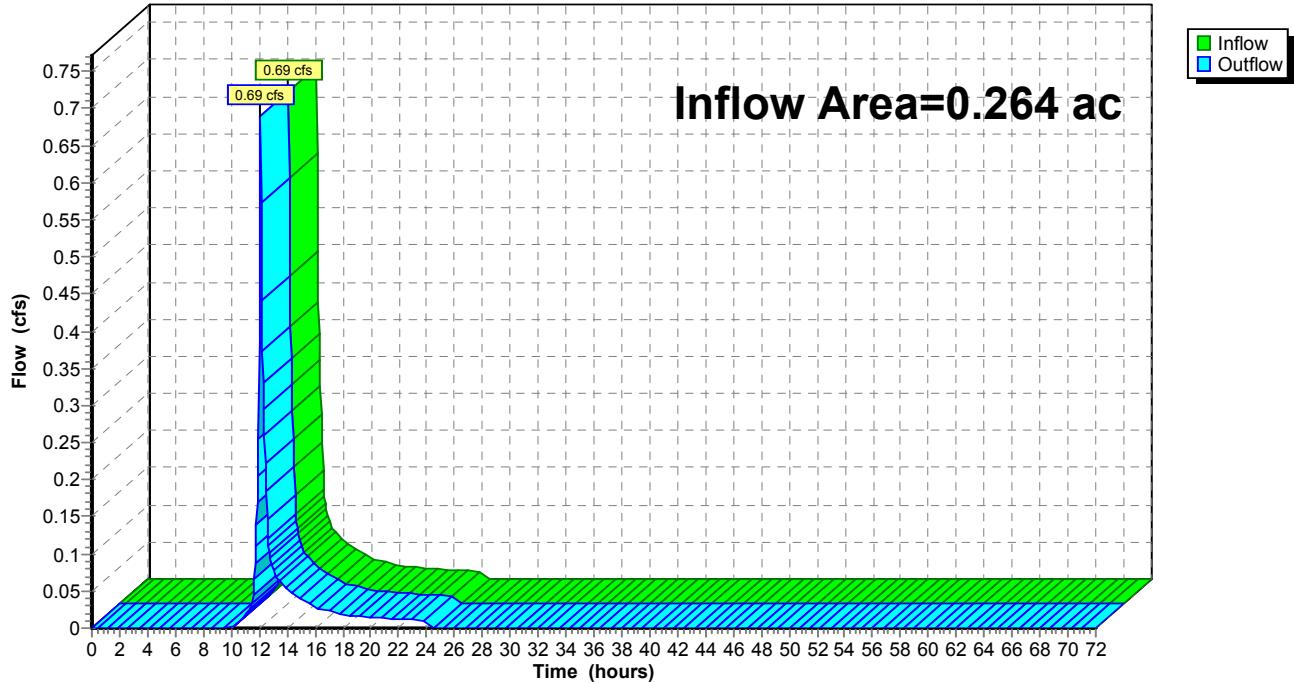
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.264 ac, 47.75% Impervious, Inflow Depth = 2.31" for 25-Year event
 Inflow = 0.69 cfs @ 12.10 hrs, Volume= 0.051 af
 Outflow = 0.69 cfs @ 12.10 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-1: DMH

Hydrograph



Summary for Reach DP-2: DP-2

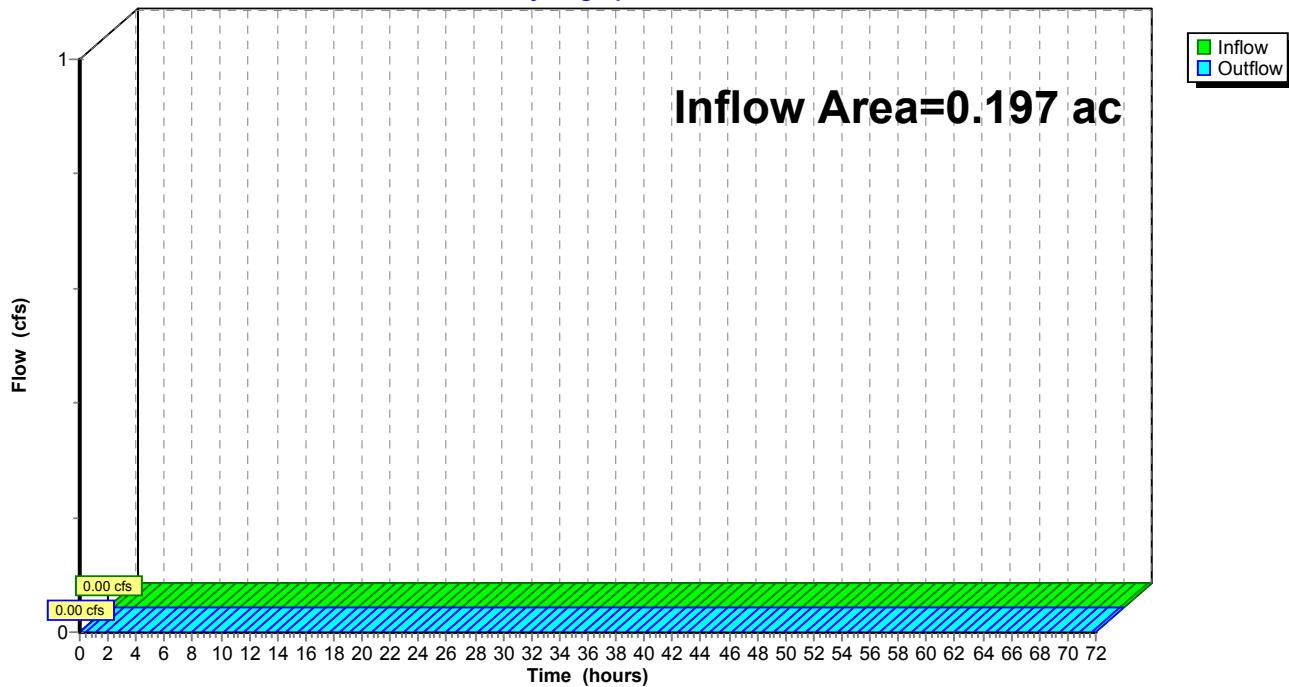
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.197 ac, 7.82% Impervious, Inflow Depth = 0.00" for 25-Year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-2: DP-2

Hydrograph



Summary for Reach DP-3: DP-3

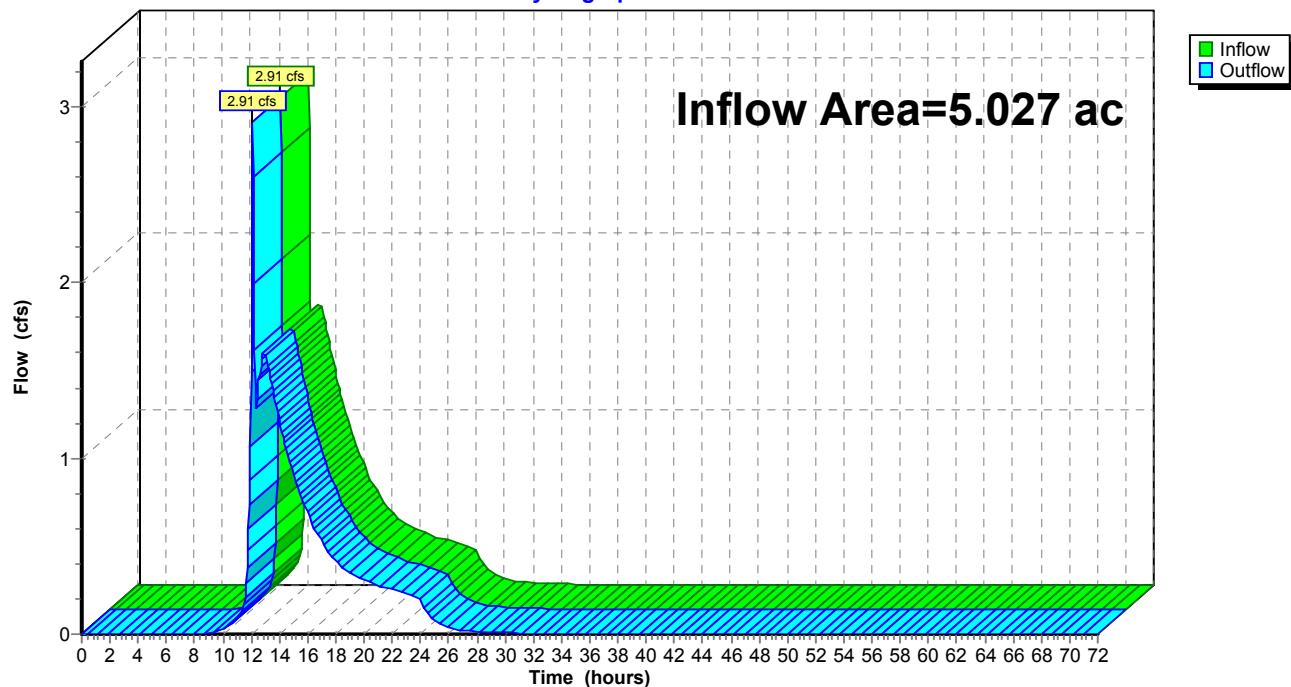
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.027 ac, 50.13% Impervious, Inflow Depth = 1.66" for 25-Year event
 Inflow = 2.91 cfs @ 12.11 hrs, Volume= 0.695 af
 Outflow = 2.91 cfs @ 12.11 hrs, Volume= 0.695 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-3: DP-3

Hydrograph



Summary for Reach DP-4: PL

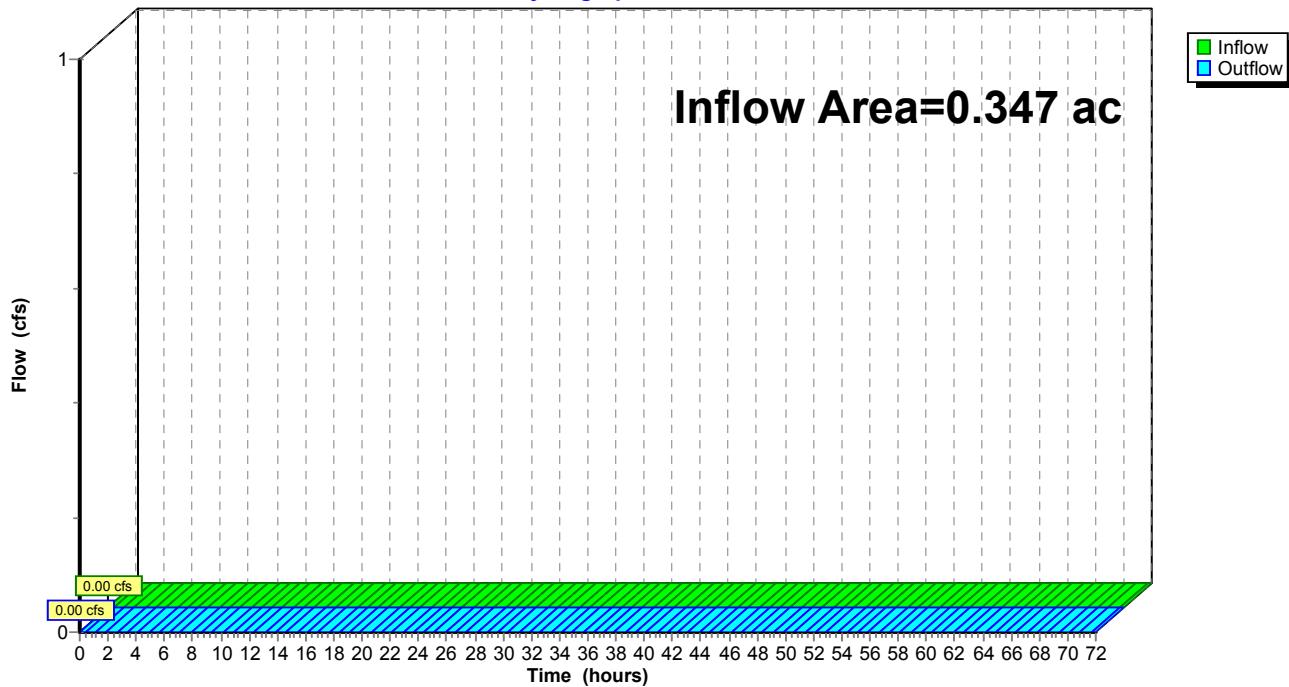
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.347 ac, 31.11% Impervious, Inflow Depth = 0.00" for 25-Year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-4: PL

Hydrograph



Summary for Reach DP-5: PL

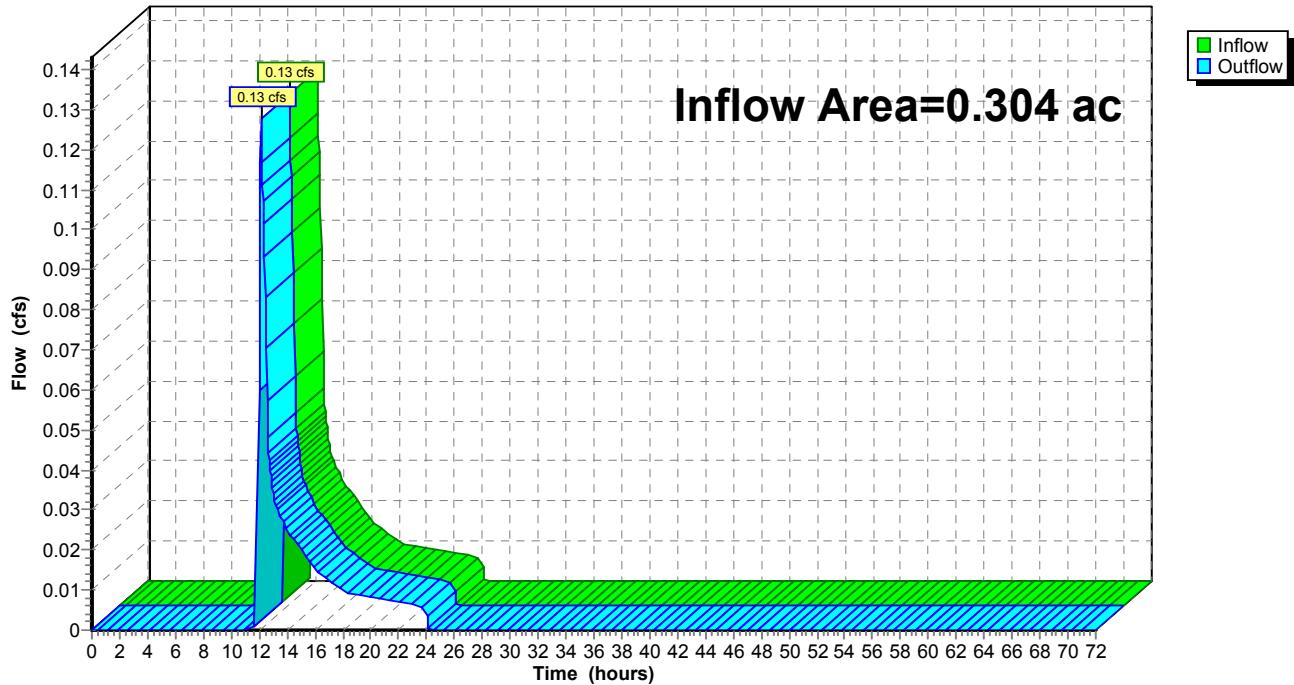
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.304 ac, 9.23% Impervious, Inflow Depth = 0.68" for 25-Year event
 Inflow = 0.13 cfs @ 12.15 hrs, Volume= 0.017 af
 Outflow = 0.13 cfs @ 12.15 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-5: PL

Hydrograph



Summary for Pond D-1: Depression

Inflow Area = 0.197 ac, 7.82% Impervious, Inflow Depth = 0.63" for 25-Year event
 Inflow = 0.07 cfs @ 12.16 hrs, Volume= 0.010 af
 Outflow = 0.07 cfs @ 12.17 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.6 min
 Discarded = 0.07 cfs @ 12.17 hrs, Volume= 0.010 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

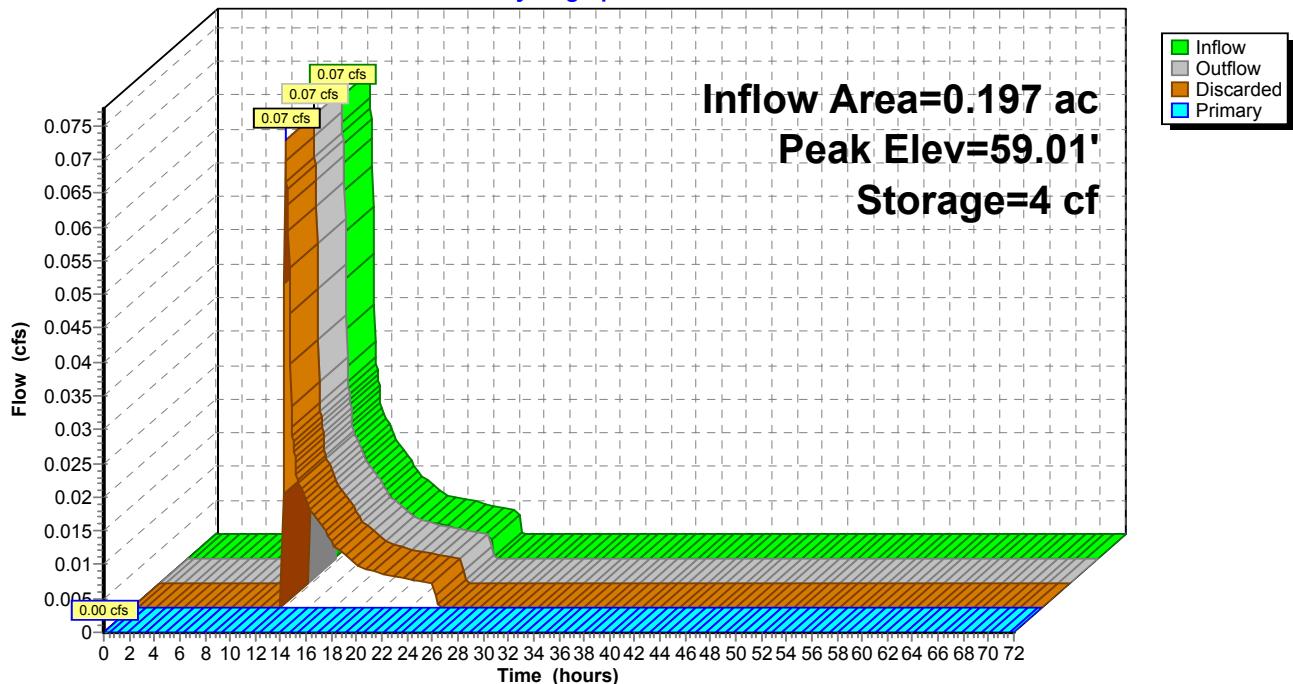
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.01' @ 12.17 hrs Surf.Area= 422 sf Storage= 4 cf

Plug-Flow detention time= 0.9 min calculated for 0.010 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (931.5 - 930.7)

Volume	Invert	Avail.Storage	Storage Description	
#1	59.00'	615 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
59.00	419	0	0	
60.00	811	615	615	
Device	Routing	Invert	Outlet Devices	
#1	Discarded	59.00'	8.270 in/hr Exfiltration over Surface area	Phase-In= 0.01'
#2	Primary	60.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir	
			Head (feet)	0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
				2.50 3.00 3.50 4.00 4.50
			Coef. (English)	2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
				2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.07 cfs @ 12.17 hrs HW=59.01' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' TW=0.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond D-1: Depression**Hydrograph**

Summary for Pond D-2: Depression

Inflow Area = 0.371 ac, 20.21% Impervious, Inflow Depth = 1.42" for 25-Year event
 Inflow = 0.54 cfs @ 12.11 hrs, Volume= 0.044 af
 Outflow = 0.17 cfs @ 12.51 hrs, Volume= 0.044 af, Atten= 69%, Lag= 24.2 min
 Discarded = 0.17 cfs @ 12.51 hrs, Volume= 0.044 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

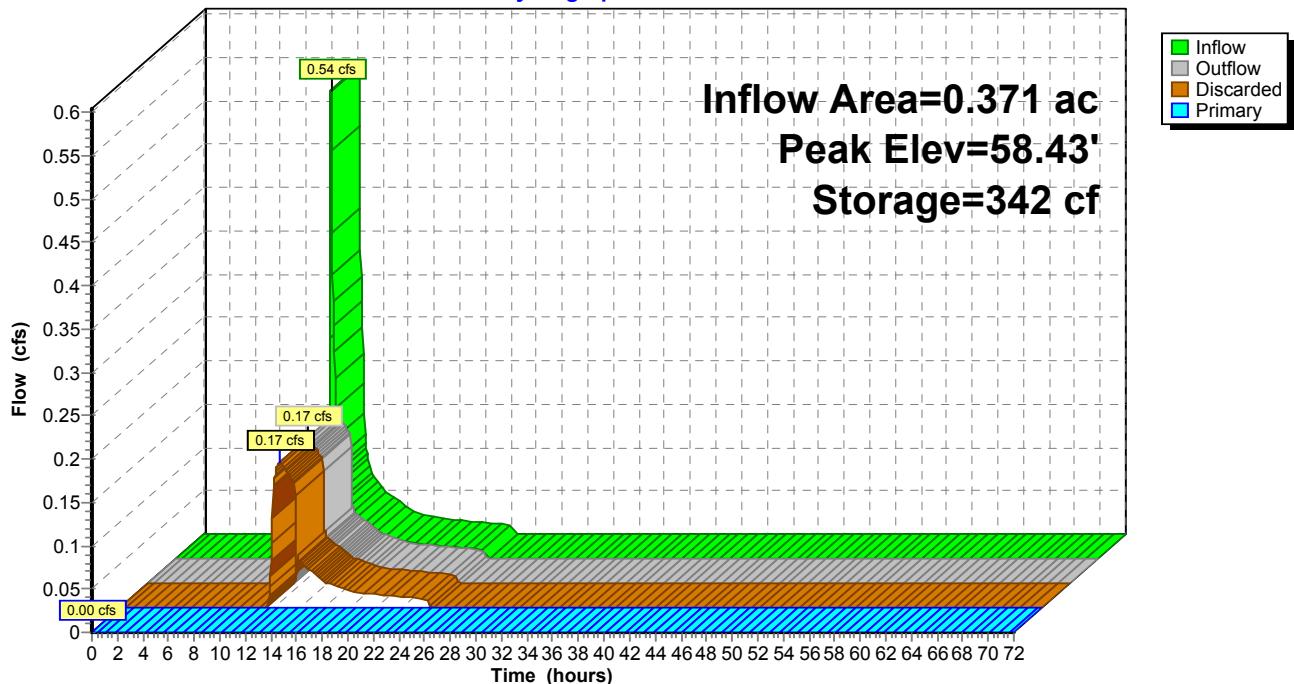
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 58.43' @ 12.51 hrs Surf.Area= 873 sf Storage= 342 cf

Plug-Flow detention time= 11.4 min calculated for 0.044 af (100% of inflow)
 Center-of-Mass det. time= 11.4 min (889.3 - 877.9)

Volume	Invert	Avail.Storage	Storage Description	
#1	58.00'	899 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
58.00	726	0	0	
59.00	1,071	899	899	
Device	Routing	Invert	Outlet Devices	
#1	Discarded	58.00'	8.270 in/hr Exfiltration over Surface area	Phase-In= 0.01'
#2	Primary	59.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir	
			Head (feet)	0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
				2.50 3.00 3.50 4.00 4.50
			Coef. (English)	2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
				2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.17 cfs @ 12.51 hrs HW=58.43' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' TW=56.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond D-2: Depression**Hydrograph**

Summary for Pond D-3: Depression

Inflow Area = 0.270 ac, 37.46% Impervious, Inflow Depth = 1.81" for 25-Year event
 Inflow = 0.53 cfs @ 12.10 hrs, Volume= 0.041 af
 Outflow = 0.03 cfs @ 11.80 hrs, Volume= 0.041 af, Atten= 94%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.80 hrs, Volume= 0.041 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 63.85' @ 15.53 hrs Surf.Area= 1,276 sf Storage= 863 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 309.4 min (1,172.8 - 863.4)

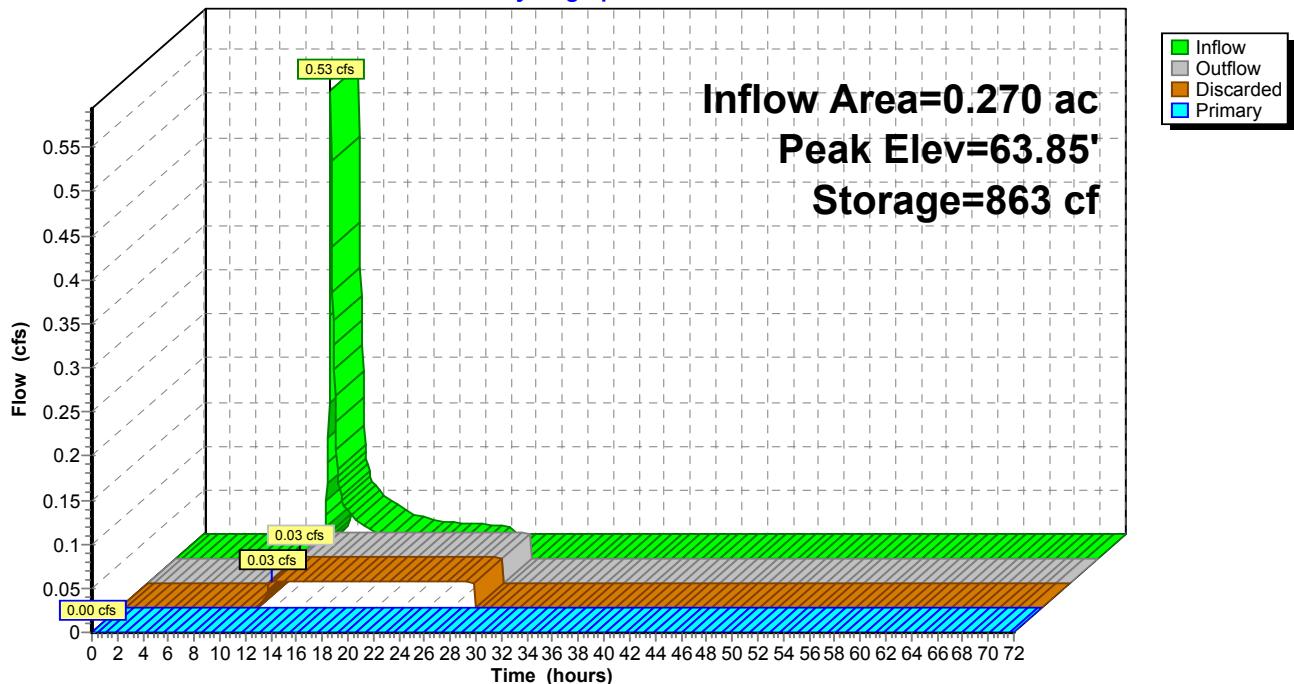
Volume	Invert	Avail.Storage	Storage Description	
#1	63.00'	2,747 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
63.00	757	0	0
64.00	1,368	1,063	1,063
65.00	2,001	1,685	2,747

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	0.03 cfs Exfiltration when above 63.00'
#2	Primary	65.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.03 cfs @ 11.80 hrs HW=63.02' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=63.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond D-3: Depression**Hydrograph**

Summary for Pond D-4: Depression

Inflow Area = 0.078 ac, 9.16% Impervious, Inflow Depth = 0.63" for 25-Year event
 Inflow = 0.03 cfs @ 12.16 hrs, Volume= 0.004 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

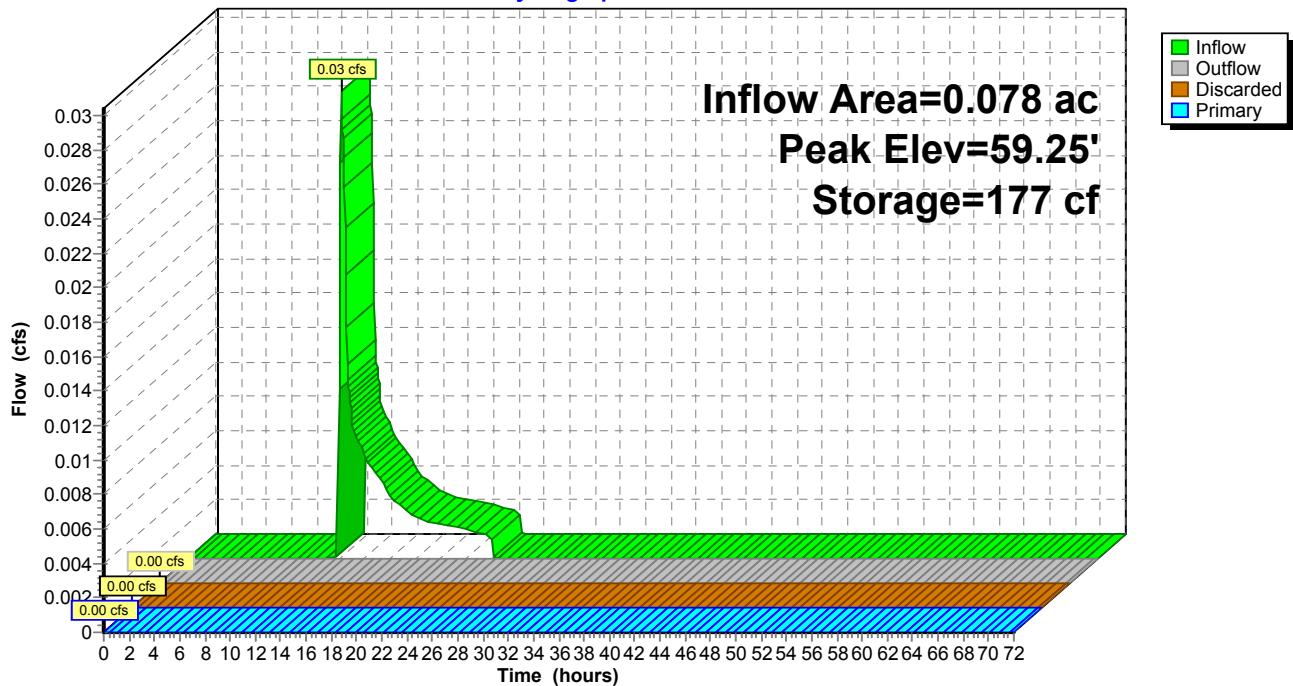
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.25' @ 24.40 hrs Surf.Area= 782 sf Storage= 177 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description	
#1	59.00'	938 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
59.00	622	0	0	
60.00	1,254	938	938	
Device	Routing	Invert	Outlet Devices	
#1	Discarded	63.00'	0.03 cfs Exfiltration when above 63.00'	
#2	Primary	65.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32	

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' (Free Discharge)
 ↑ 1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' TW=0.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond D-4: Depression**Hydrograph**

Summary for Pond DB-1: Prop Detention Basin

Inflow Area = 3.691 ac, 55.72% Impervious, Inflow Depth = 2.84" for 25-Year event
 Inflow = 12.04 cfs @ 12.09 hrs, Volume= 0.874 af
 Outflow = 1.27 cfs @ 13.01 hrs, Volume= 0.481 af, Atten= 89%, Lag= 54.7 min
 Primary = 1.27 cfs @ 13.01 hrs, Volume= 0.481 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.54' @ 13.01 hrs Surf.Area= 10,447 sf Storage= 20,532 cf

Plug-Flow detention time= 275.0 min calculated for 0.481 af (55% of inflow)
 Center-of-Mass det. time= 161.5 min (995.1 - 833.6)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	25,568 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	5,474	0	0
59.00	7,714	6,594	6,594
60.00	9,473	8,594	15,188
61.00	11,288	10,381	25,568

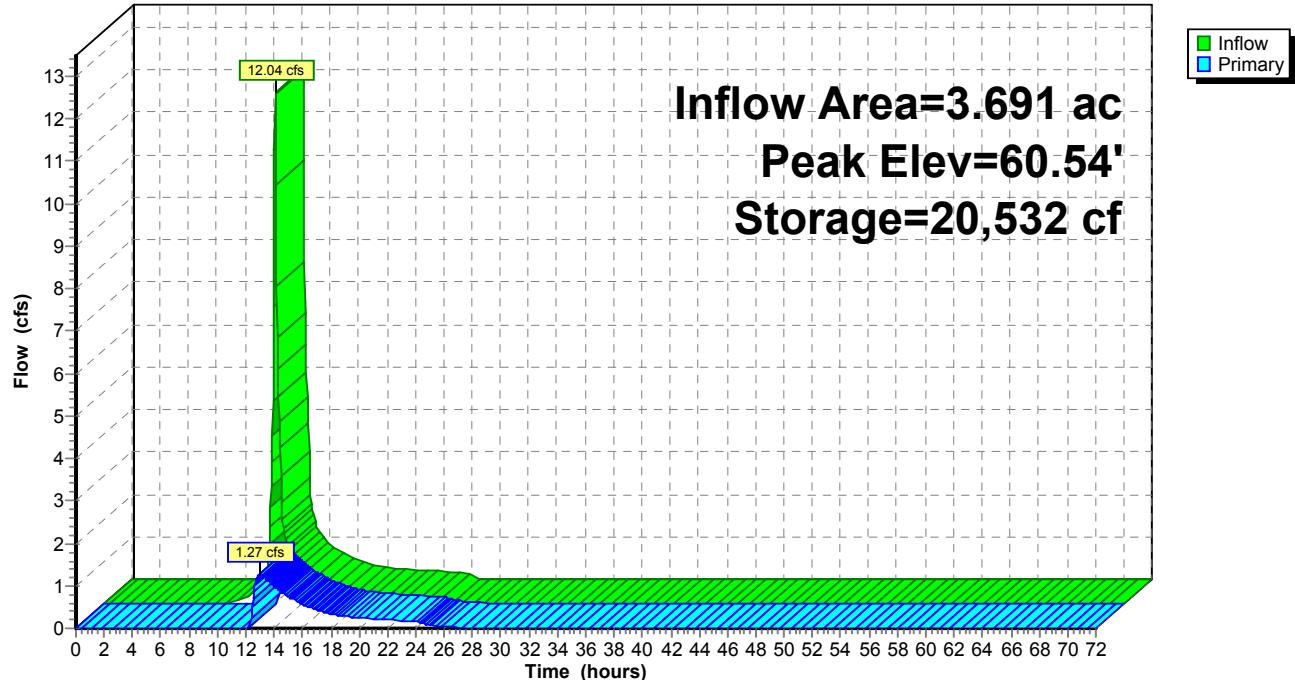
Device	Routing	Invert	Outlet Devices
#1	Primary	58.20'	10.0" Round Culvert L= 25.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 58.20' / 58.05' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 0.55 sf
#2	Device 1	60.20'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.6' Crest Height
#3	Device 1	61.50'	7.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s) 2.4' Crest Height

Primary OutFlow Max=1.27 cfs @ 13.01 hrs HW=60.54' TW=56.03' (Dynamic Tailwater)

↑ 1=Culvert (Passes 1.27 cfs of 3.56 cfs potential flow)

 └─ 2=Sharp-Crested Rectangular Weir(Weir Controls 1.27 cfs @ 1.95 fps)

 └─ 3=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond DB-1: Prop Detention Basin**Hydrograph**

Summary for Pond P1: Infiltration Chambers

Inflow Area = 0.044 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.020 af
 Outflow = 0.04 cfs @ 11.70 hrs, Volume= 0.020 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.70 hrs, Volume= 0.020 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.99' @ 12.57 hrs Surf.Area= 199 sf Storage= 228 cf

Plug-Flow detention time= 32.6 min calculated for 0.020 af (100% of inflow)
 Center-of-Mass det. time= 32.5 min (778.5 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	195 cf	6.33'W x 31.50'L x 3.54'H Field A 707 cf Overall - 220 cf Embedded = 487 cf x 40.0% Voids
#2A	56.70'	220 cf	Cultec R-330XLHD x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.200 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.70 hrs HW=56.25' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P1: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

4 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 29.50' Row Length +12.0" End Stone x 2 = 31.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

4 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 219.8 cf Chamber Storage

706.6 cf Field - 219.8 cf Chambers = 486.8 cf Stone x 40.0% Voids = 194.7 cf Stone Storage

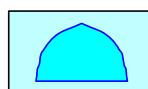
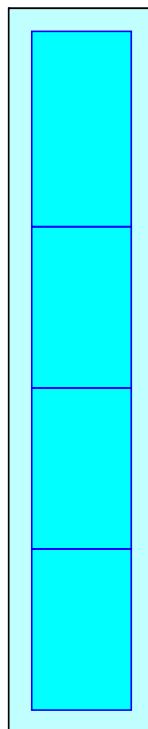
Chamber Storage + Stone Storage = 414.5 cf = 0.010 af

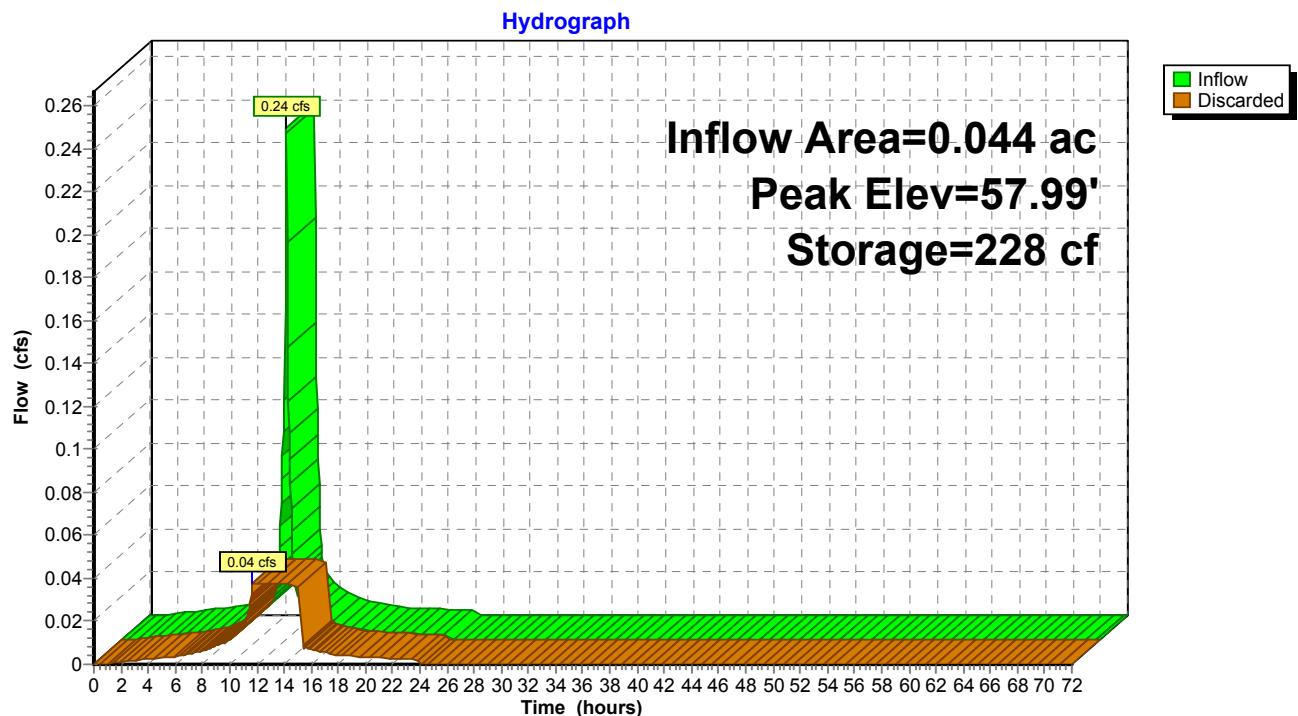
Overall Storage Efficiency = 58.7%

4 Chambers

26.2 cy Field

18.0 cy Stone



Pond P1: Infiltration Chambers

Summary for Pond P10: Infiltration Chambers

Inflow Area = 0.044 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.020 af
 Outflow = 0.04 cfs @ 11.70 hrs, Volume= 0.020 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.70 hrs, Volume= 0.020 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.38' @ 12.56 hrs Surf.Area= 199 sf Storage= 227 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 32.0 min (777.9 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	195 cf	6.33'W x 31.50'L x 3.54'H Field A 707 cf Overall - 220 cf Embedded = 487 cf x 40.0% Voids
#2A	60.10'	220 cf	Cultec R-330XLHD x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.70 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P10: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

4 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 29.50' Row Length +12.0" End Stone x 2 = 31.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

4 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 219.8 cf Chamber Storage

706.6 cf Field - 219.8 cf Chambers = 486.8 cf Stone x 40.0% Voids = 194.7 cf Stone Storage

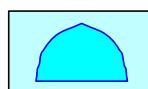
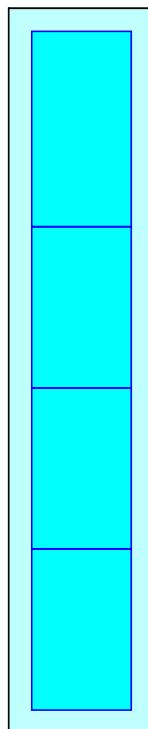
Chamber Storage + Stone Storage = 414.5 cf = 0.010 af

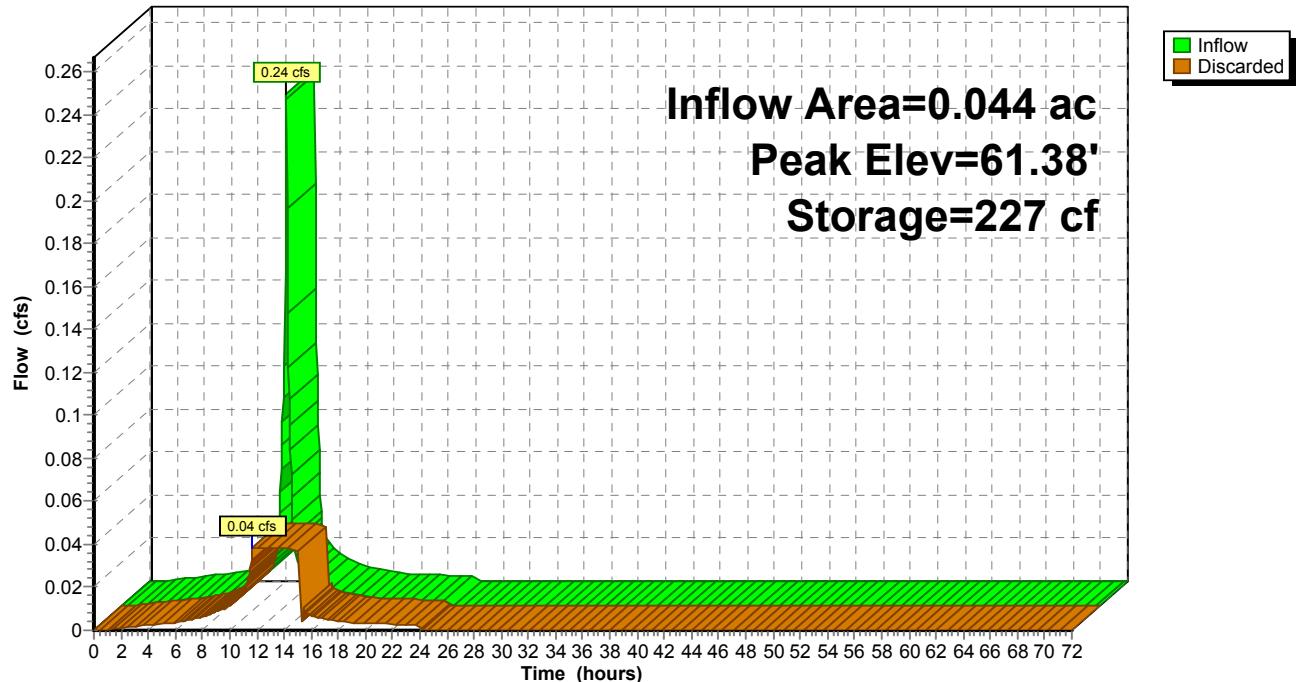
Overall Storage Efficiency = 58.7%

4 Chambers

26.2 cy Field

18.0 cy Stone



Pond P10: Infiltration Chambers**Hydrograph**

Summary for Pond P11: Infiltration Chambers

Inflow Area = 0.087 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.48 cfs @ 12.09 hrs, Volume= 0.040 af
 Outflow = 0.06 cfs @ 11.65 hrs, Volume= 0.040 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.65 hrs, Volume= 0.040 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 65.30' @ 12.62 hrs Surf.Area= 332 sf Storage= 498 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 45.5 min (791.4 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	63.00'	321 cf	6.33'W x 52.50'L x 3.54'H Field A 1,178 cf Overall - 376 cf Embedded = 801 cf x 40.0% Voids
#2A	63.50'	376 cf	Cultec R-330XLHD x 7 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
697 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.06 cfs @ 11.65 hrs HW=63.04' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.06 cfs)

Pond P11: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

7 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 50.50' Row Length +12.0" End Stone x 2 = 52.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

7 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 376.3 cf Chamber Storage

1,177.6 cf Field - 376.3 cf Chambers = 801.3 cf Stone x 40.0% Voids = 320.5 cf Stone Storage

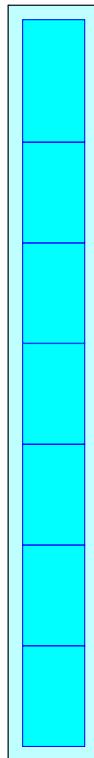
Chamber Storage + Stone Storage = 696.8 cf = 0.016 af

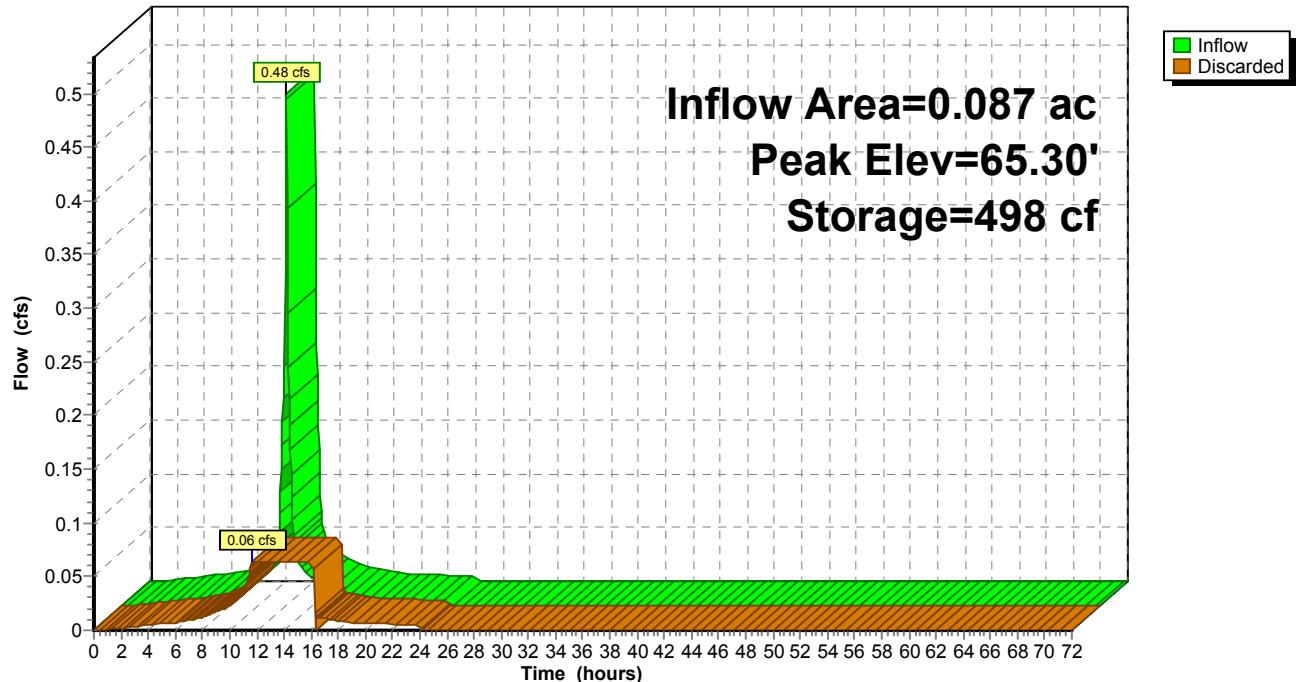
Overall Storage Efficiency = 59.2%

7 Chambers

43.6 cy Field

29.7 cy Stone



Pond P11: Infiltration Chambers**Hydrograph**

Summary for Pond P12: Infiltration Chambers

Inflow Area = 0.168 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.92 cfs @ 12.09 hrs, Volume= 0.077 af
 Outflow = 0.19 cfs @ 11.75 hrs, Volume= 0.077 af, Atten= 80%, Lag= 0.0 min
 Discarded = 0.19 cfs @ 11.75 hrs, Volume= 0.077 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.40' @ 12.51 hrs Surf.Area= 977 sf Storage= 748 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 19.5 min (765.4 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	875 cf	11.17'W x 87.50'L x 3.54'H Field A 3,461 cf Overall - 1,274 cf Embedded = 2,186 cf x 40.0% Voids
#2A	56.70'	1,274 cf	Cultec R-330XLHD x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
2,149 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.19 cfs @ 11.75 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.19 cfs)

Pond P12: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

12 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 85.50' Row Length +12.0" End Stone x 2 = 87.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

24 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,274.1 cf Chamber Storage

3,460.5 cf Field - 1,274.1 cf Chambers = 2,186.4 cf Stone x 40.0% Voids = 874.6 cf Stone Storage

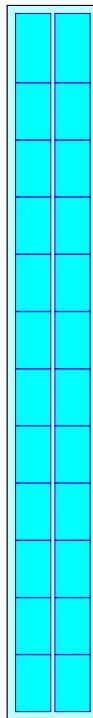
Chamber Storage + Stone Storage = 2,148.7 cf = 0.049 af

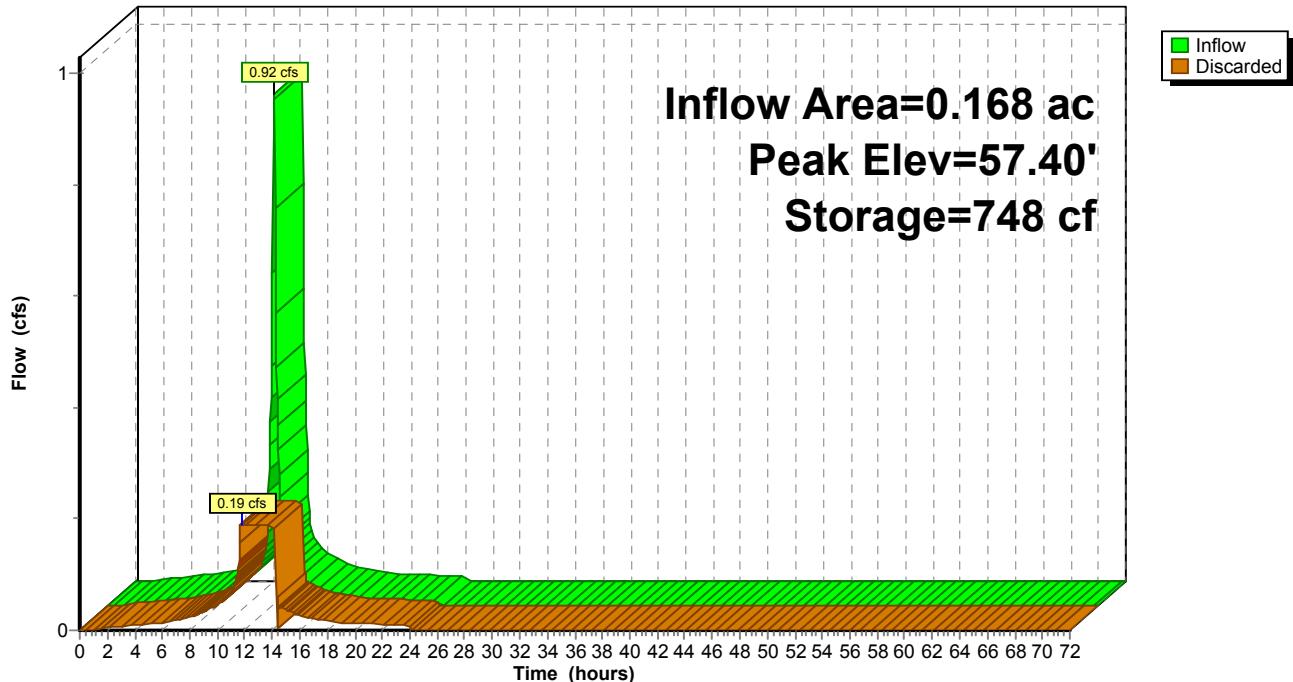
Overall Storage Efficiency = 62.1%

24 Chambers

128.2 cy Field

81.0 cy Stone



Pond P12: Infiltration Chambers**Hydrograph**

Summary for Pond P13: Infiltration Chambers

Inflow Area = 0.138 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.75 cfs @ 12.09 hrs, Volume= 0.063 af
 Outflow = 0.19 cfs @ 11.80 hrs, Volume= 0.063 af, Atten= 75%, Lag= 0.0 min
 Discarded = 0.19 cfs @ 11.80 hrs, Volume= 0.063 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.11' @ 12.46 hrs Surf.Area= 977 sf Storage= 520 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 12.6 min (758.5 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	875 cf	11.17'W x 87.50'L x 3.54'H Field A 3,461 cf Overall - 1,274 cf Embedded = 2,186 cf x 40.0% Voids
#2A	56.70'	1,274 cf	Cultec R-330XLHD x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
2,149 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.19 cfs @ 11.80 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.19 cfs)

Pond P13: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

12 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 85.50' Row Length +12.0" End Stone x 2 = 87.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

24 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,274.1 cf Chamber Storage

3,460.5 cf Field - 1,274.1 cf Chambers = 2,186.4 cf Stone x 40.0% Voids = 874.6 cf Stone Storage

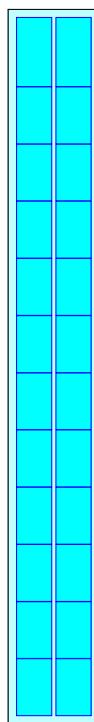
Chamber Storage + Stone Storage = 2,148.7 cf = 0.049 af

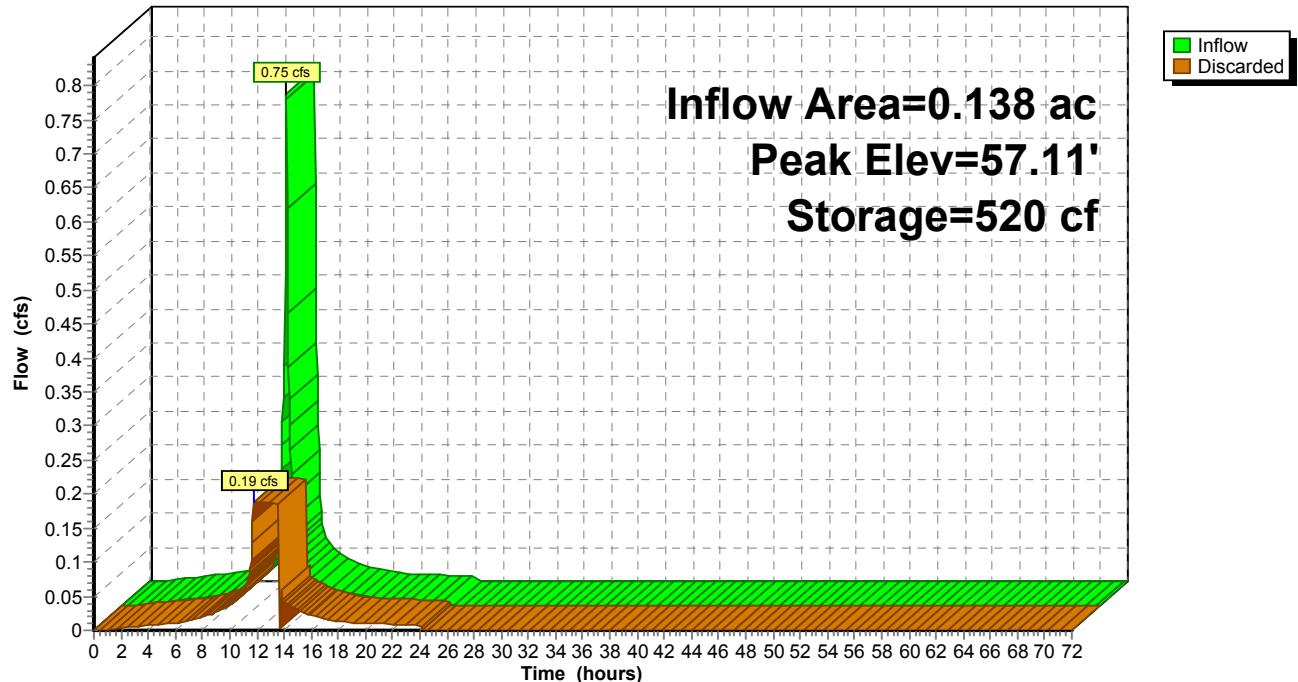
Overall Storage Efficiency = 62.1%

24 Chambers

128.2 cy Field

81.0 cy Stone



Pond P13: Infiltration Chambers**Hydrograph**

Summary for Pond P14: Infiltration Chambers

Inflow Area = 0.173 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.94 cfs @ 12.09 hrs, Volume= 0.079 af
 Outflow = 0.13 cfs @ 11.65 hrs, Volume= 0.079 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.13 cfs @ 11.65 hrs, Volume= 0.079 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.65' @ 12.61 hrs Surf.Area= 664 sf Storage= 983 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 44.9 min (790.8 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	58.50'	599 cf	11.17'W x 59.50'L x 3.54'H Field A 2,353 cf Overall - 857 cf Embedded = 1,496 cf x 40.0% Voids
#2A	59.00'	857 cf	Cultec R-330XLHD x 16 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
1,455 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	58.50'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.13 cfs @ 11.65 hrs HW=58.54' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.13 cfs)

Pond P14: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

8 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 57.50' Row Length +12.0" End Stone x 2 = 59.50'
Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

16 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 856.9 cf Chamber Storage

2,353.1 cf Field - 856.9 cf Chambers = 1,496.3 cf Stone x 40.0% Voids = 598.5 cf Stone Storage

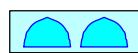
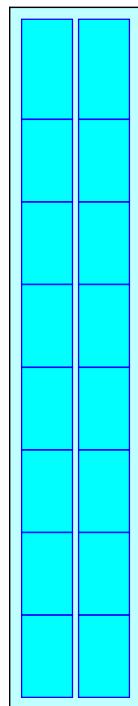
Chamber Storage + Stone Storage = 1,455.4 cf = 0.033 af

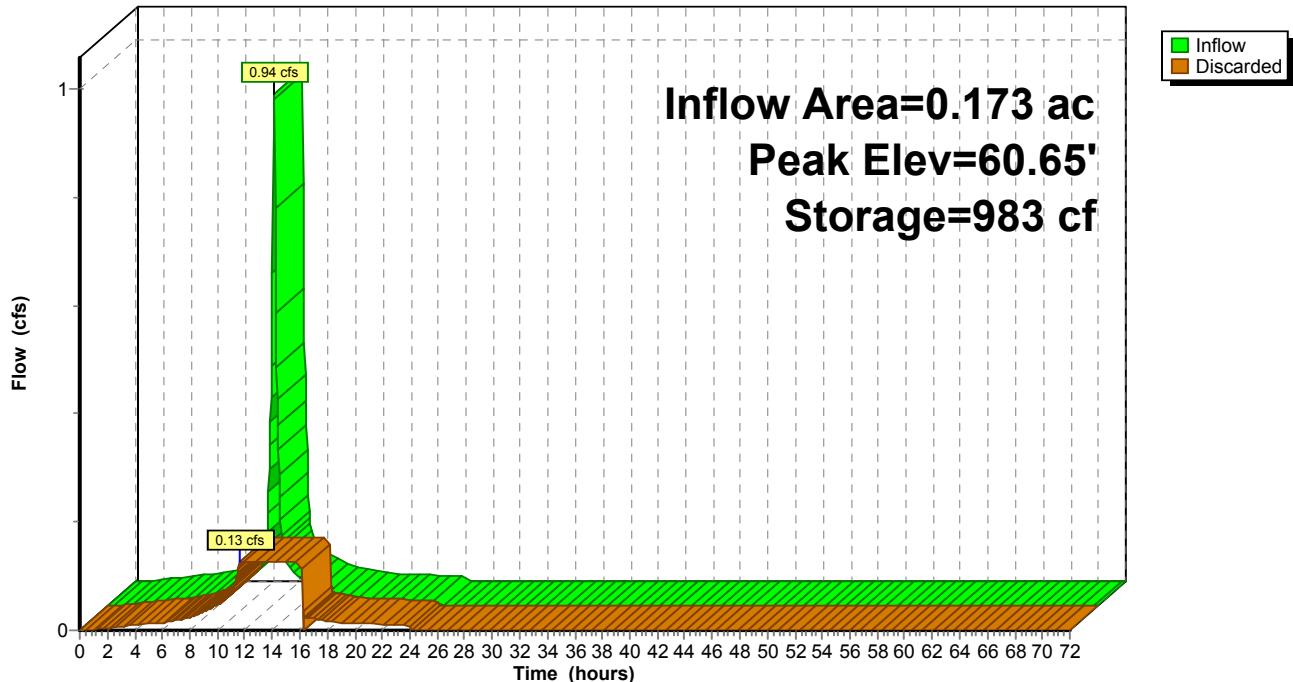
Overall Storage Efficiency = 61.8%

16 Chambers

87.2 cy Field

55.4 cy Stone



Pond P14: Infiltration Chambers**Hydrograph**

Summary for Pond P15: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.39' @ 12.56 hrs Surf.Area= 111 sf Storage= 124 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 31.4 min (777.4 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P15: Infiltration Chambers - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

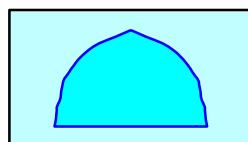
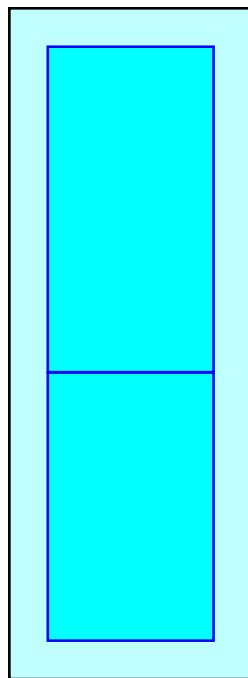
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

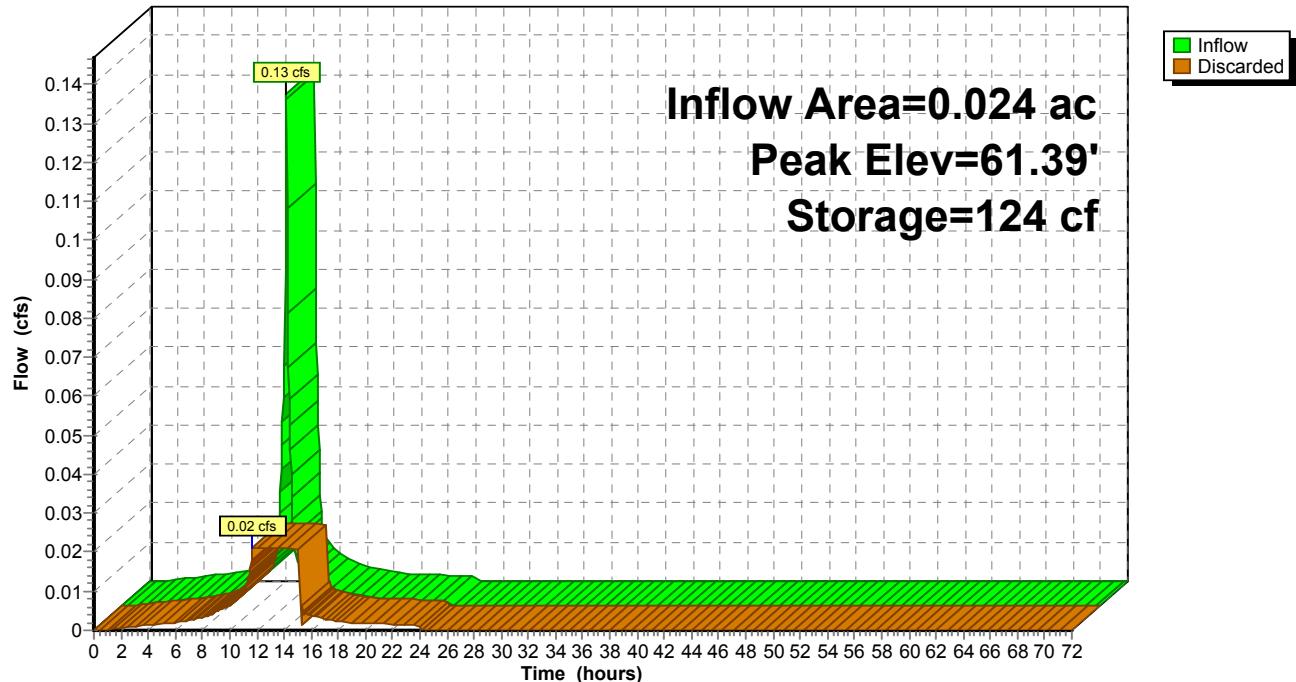
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P15: Infiltration Chambers**Hydrograph**

Summary for Pond P16: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.41' @ 12.56 hrs Surf.Area= 111 sf Storage= 126 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 32.0 min (777.9 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P16: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

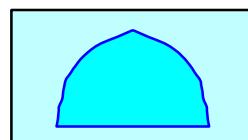
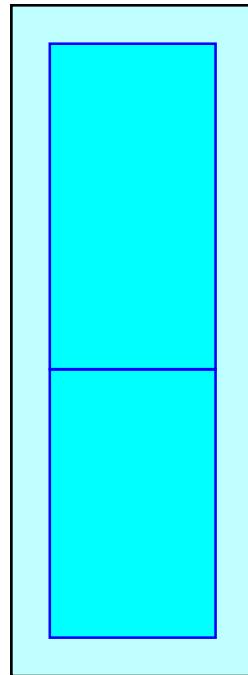
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

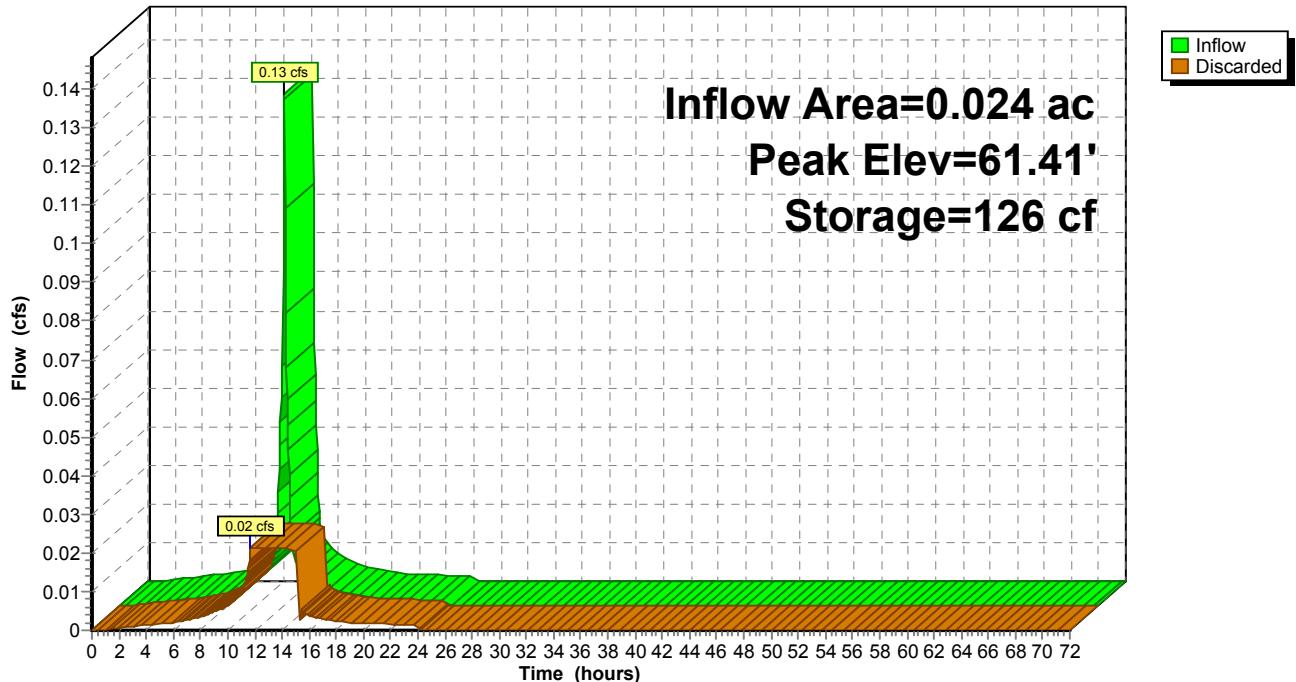
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P16: Infiltration Chambers**Hydrograph**

Summary for Pond P17: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.38' @ 12.56 hrs Surf.Area= 111 sf Storage= 123 cf

Plug-Flow detention time= 31.2 min calculated for 0.011 af (100% of inflow)
 Center-of-Mass det. time= 31.1 min (777.1 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P17: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

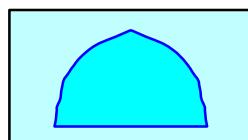
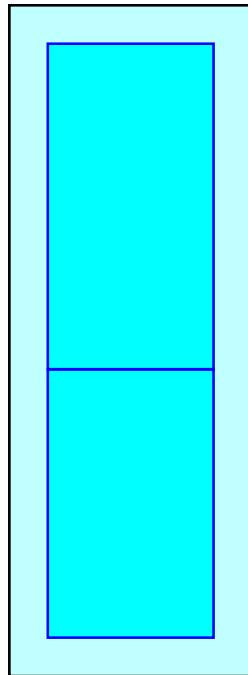
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

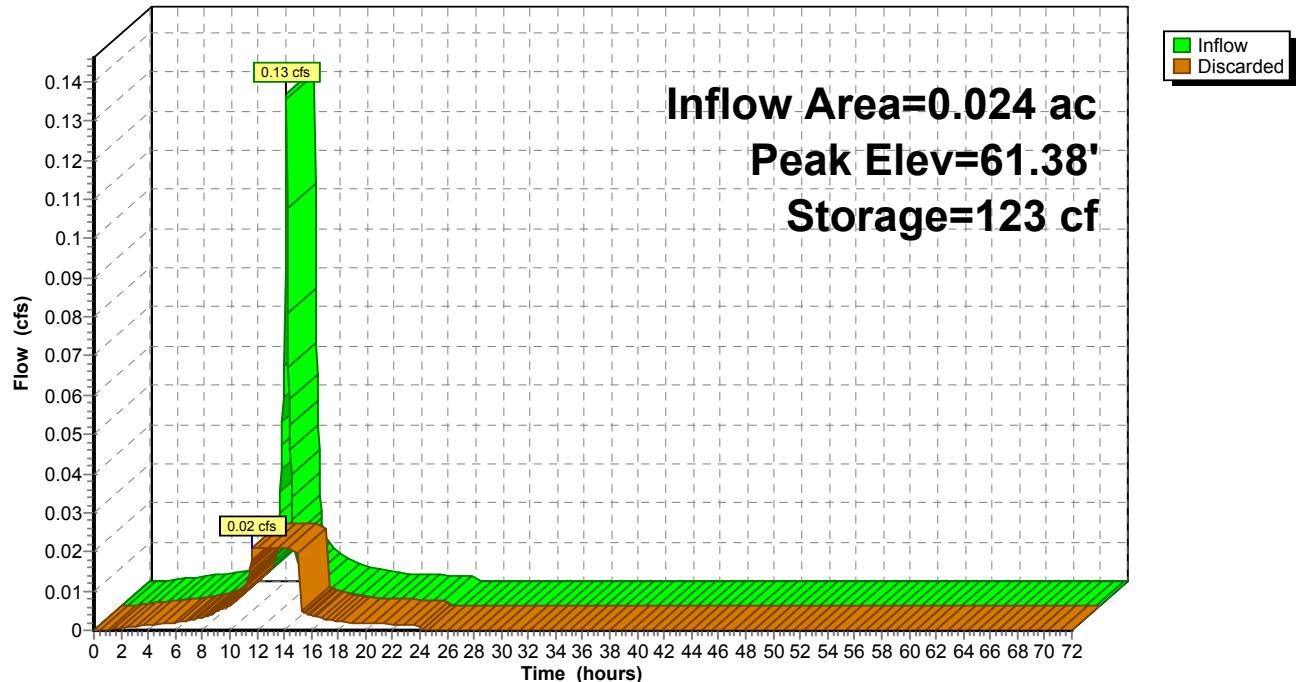
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P17: Infiltration Chambers**Hydrograph**

Summary for Pond P18: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.37' @ 12.56 hrs Surf.Area= 111 sf Storage= 123 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 31.0 min (776.9 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P18: Infiltration Chambers - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

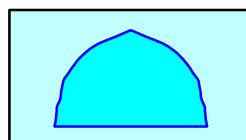
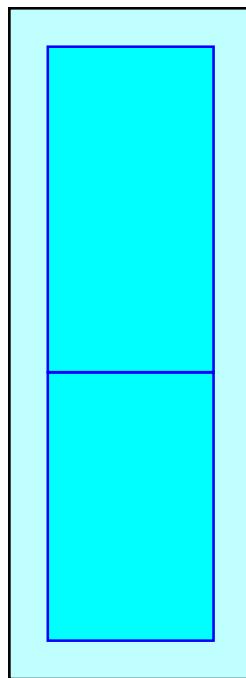
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

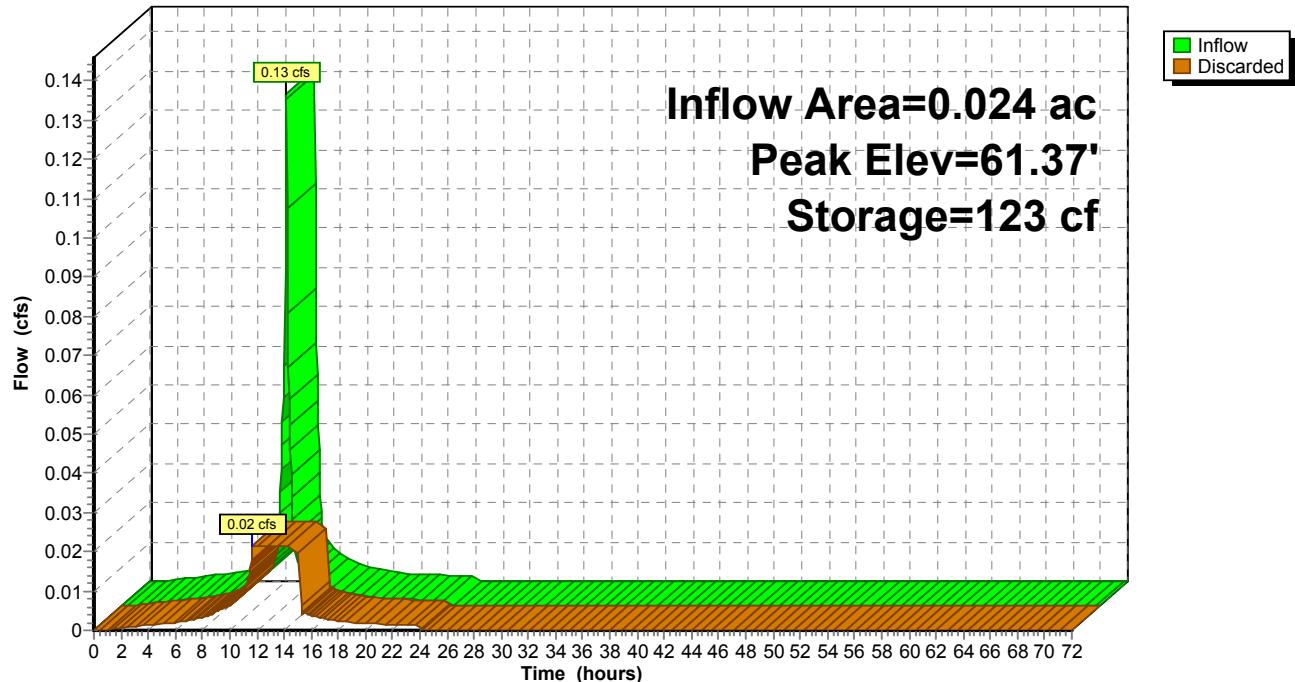
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P18: Infiltration Chambers**Hydrograph**

Summary for Pond P2: Infiltration Chambers

Inflow Area = 0.349 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 1.90 cfs @ 12.09 hrs, Volume= 0.159 af
 Outflow = 0.27 cfs @ 11.70 hrs, Volume= 0.159 af, Atten= 86%, Lag= 0.0 min
 Discarded = 0.27 cfs @ 11.70 hrs, Volume= 0.159 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 58.19' @ 12.60 hrs Surf.Area= 1,385 sf Storage= 1,952 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 42.1 min (788.0 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	1,194 cf	20.83'W x 66.50'L x 3.54'H Field A 4,907 cf Overall - 1,922 cf Embedded = 2,984 cf x 40.0% Voids
#2A	56.70'	1,922 cf	Cultec R-330XLHD x 36 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
3,116 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.27 cfs @ 11.70 hrs HW=56.27' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.27 cfs)

Pond P2: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

9 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 64.50' Row Length +12.0" End Stone x 2 = 66.50'
Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

36 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 1,922.4 cf Chamber Storage

4,906.7 cf Field - 1,922.4 cf Chambers = 2,984.3 cf Stone x 40.0% Voids = 1,193.7 cf Stone Storage

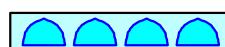
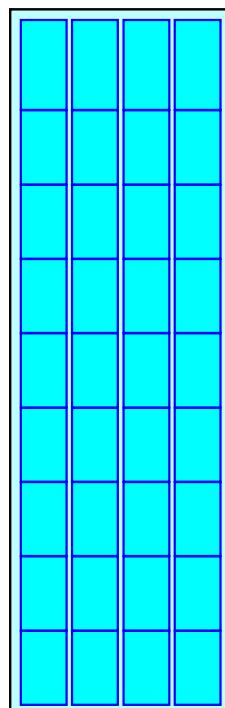
Chamber Storage + Stone Storage = 3,116.1 cf = 0.072 af

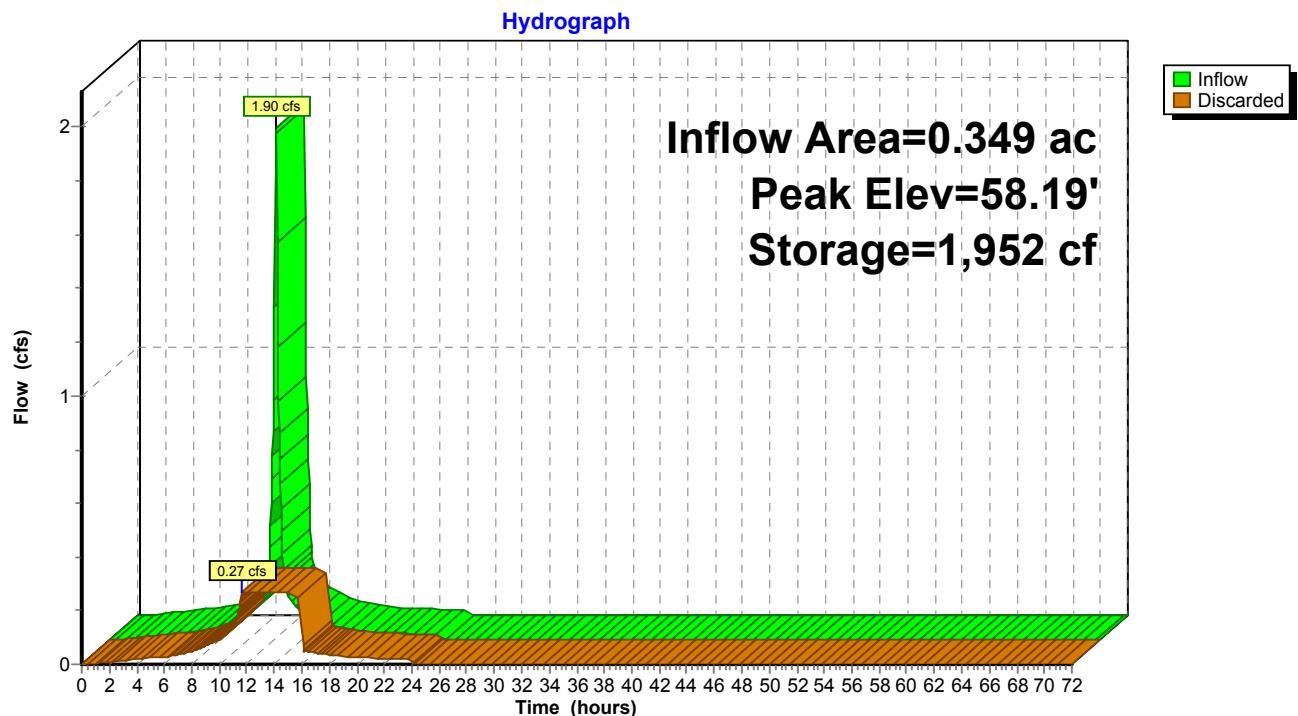
Overall Storage Efficiency = 63.5%

36 Chambers

181.7 cy Field

110.5 cy Stone



Pond P2: Infiltration Chambers

Summary for Pond P3: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.99' @ 12.56 hrs Surf.Area= 111 sf Storage= 124 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 31.4 min (777.4 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	56.70'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P3: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

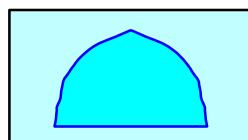
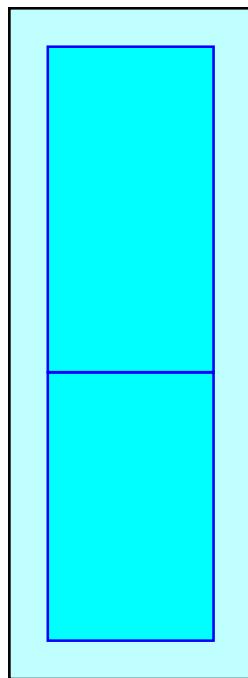
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

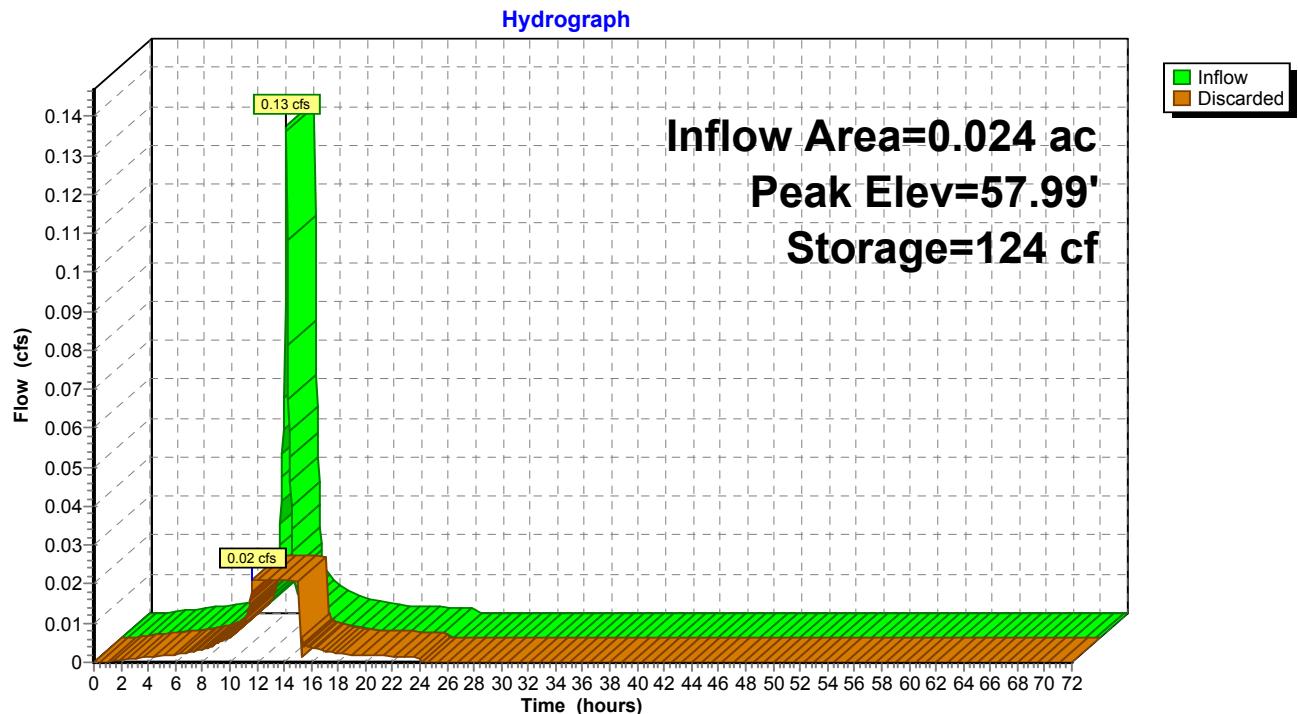
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P3: Infiltration Chambers

Summary for Pond P4: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.98' @ 12.56 hrs Surf.Area= 111 sf Storage= 124 cf

Plug-Flow detention time= 31.3 min calculated for 0.011 af (100% of inflow)
 Center-of-Mass det. time= 31.2 min (777.2 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	56.70'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P4: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

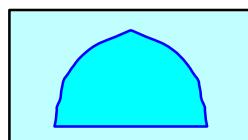
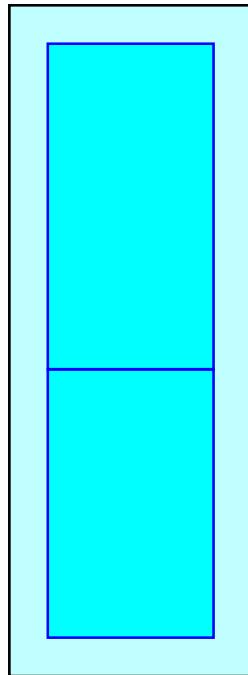
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

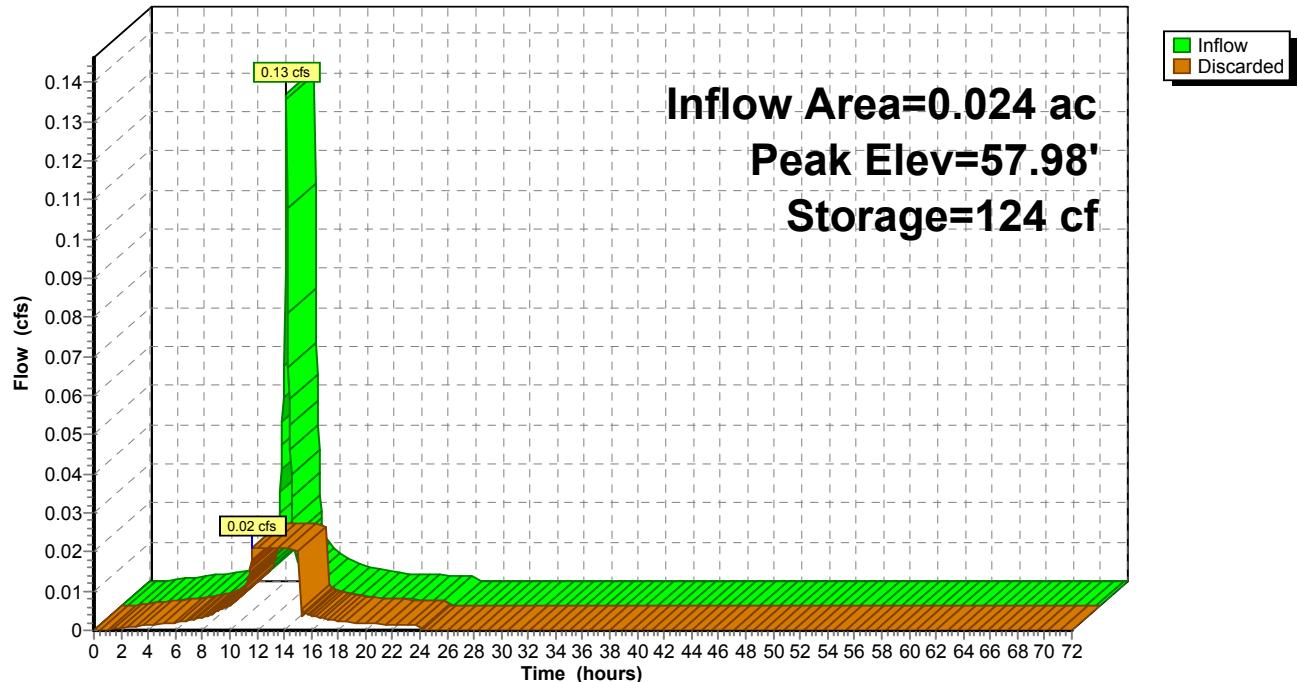
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P4: Infiltration Chambers**Hydrograph**

Summary for Pond P5: Infiltration Chambers

Inflow Area = 0.039 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.018 af
 Outflow = 0.04 cfs @ 11.70 hrs, Volume= 0.018 af, Atten= 81%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.70 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.75' @ 12.53 hrs Surf.Area= 208 sf Storage= 186 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 23.6 min (769.6 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	167 cf	4.75'W x 43.75'L x 2.54'H Field A 528 cf Overall - 111 cf Embedded = 418 cf x 40.0% Voids
#2A	56.70'	111 cf	Cultec R-150XLHD x 4 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 1 rows
278 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.70 hrs HW=56.23' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P5: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 1 rows

4 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 41.75' Row Length +12.0" End Stone x 2 = 43.75' Base Length

1 Rows x 33.0" Wide + 12.0" Side Stone x 2 = 4.75' Base Width

6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

4 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 1 Rows = 110.6 cf Chamber Storage

528.2 cf Field - 110.6 cf Chambers = 417.6 cf Stone x 40.0% Voids = 167.0 cf Stone Storage

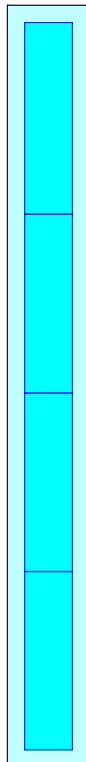
Chamber Storage + Stone Storage = 277.6 cf = 0.006 af

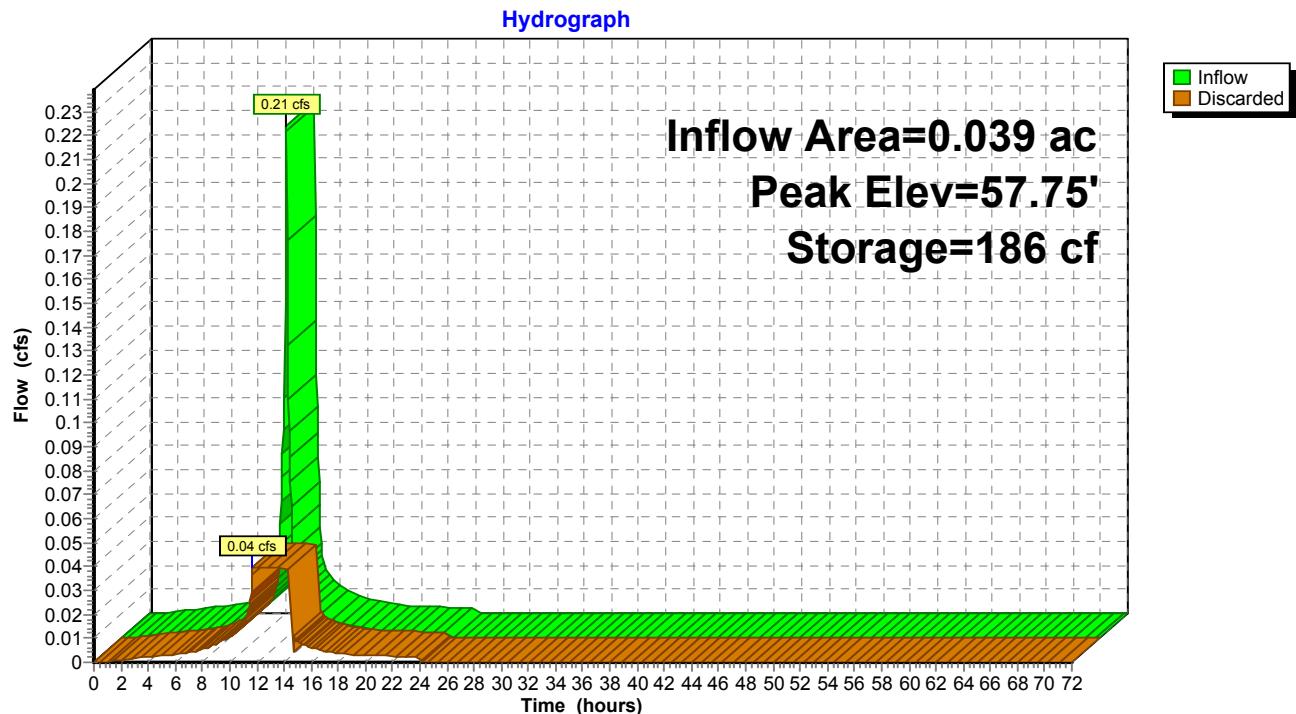
Overall Storage Efficiency = 52.6%

4 Chambers

19.6 cy Field

15.5 cy Stone



Pond P5: Infiltration Chambers

Summary for Pond P6: Infiltration Chambers

Inflow Area = 0.019 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.10 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af, Atten= 80%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.96' @ 12.51 hrs Surf.Area= 110 sf Storage= 85 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 19.6 min (765.5 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	90 cf	4.75'W x 23.25'L x 2.54'H Field A 281 cf Overall - 56 cf Embedded = 224 cf x 40.0% Voids
#2A	60.10'	56 cf	Cultec R-150XLHD x 2 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 1 rows
146 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P6: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 1 rows

2 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 21.25' Row Length +12.0" End Stone x 2 = 23.25' Base Length

1 Rows x 33.0" Wide + 12.0" Side Stone x 2 = 4.75' Base Width

6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

2 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 1 Rows = 56.3 cf Chamber Storage

280.7 cf Field - 56.3 cf Chambers = 224.4 cf Stone x 40.0% Voids = 89.8 cf Stone Storage

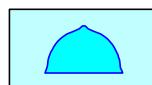
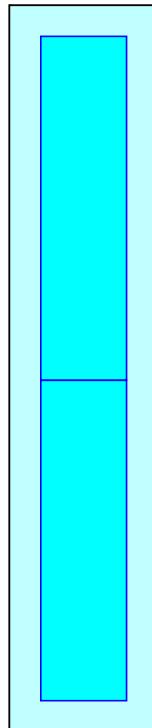
Chamber Storage + Stone Storage = 146.1 cf = 0.003 af

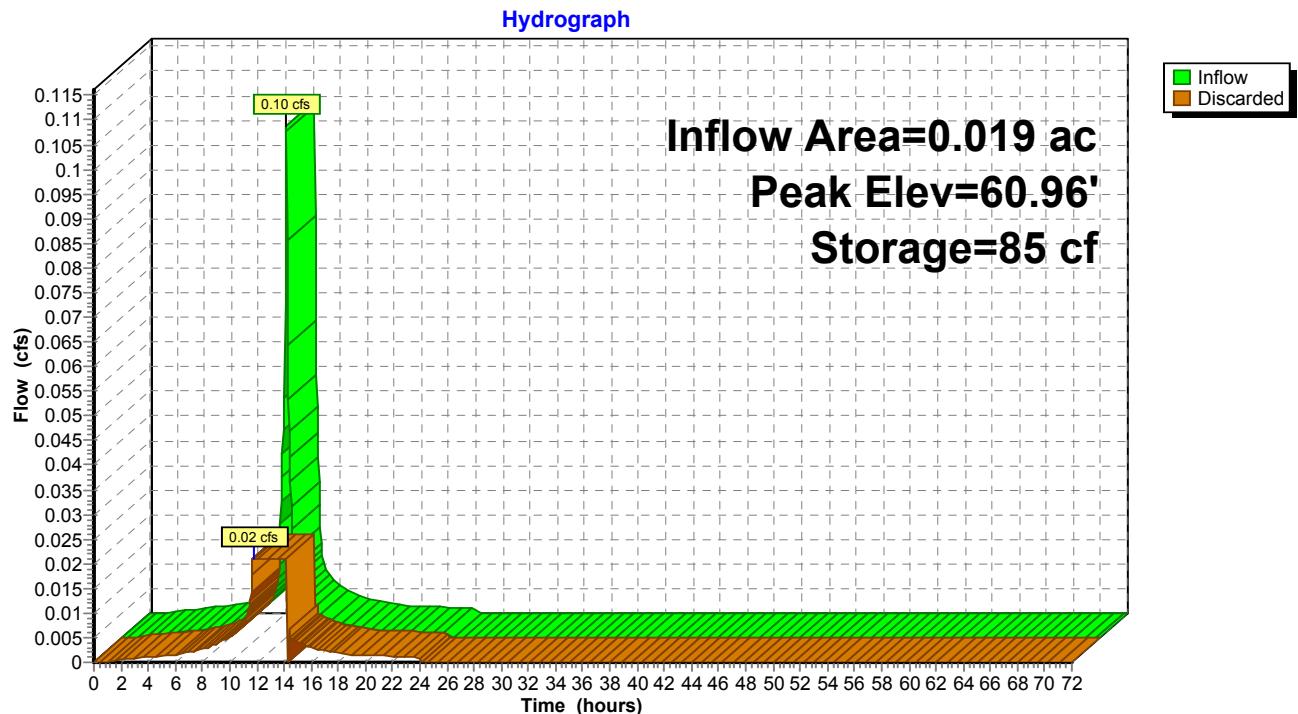
Overall Storage Efficiency = 52.0%

2 Chambers

10.4 cy Field

8.3 cy Stone



Pond P6: Infiltration Chambers

Summary for Pond P7: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.39' @ 12.56 hrs Surf.Area= 111 sf Storage= 124 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 31.4 min (777.3 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P7: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

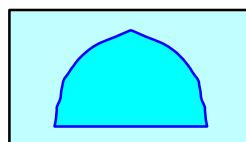
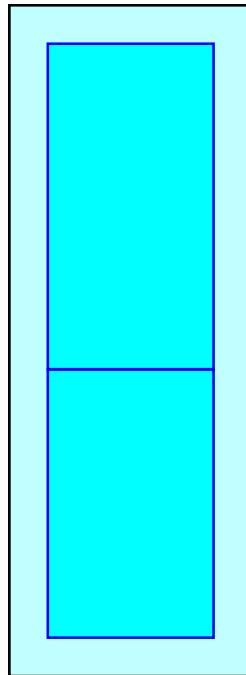
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

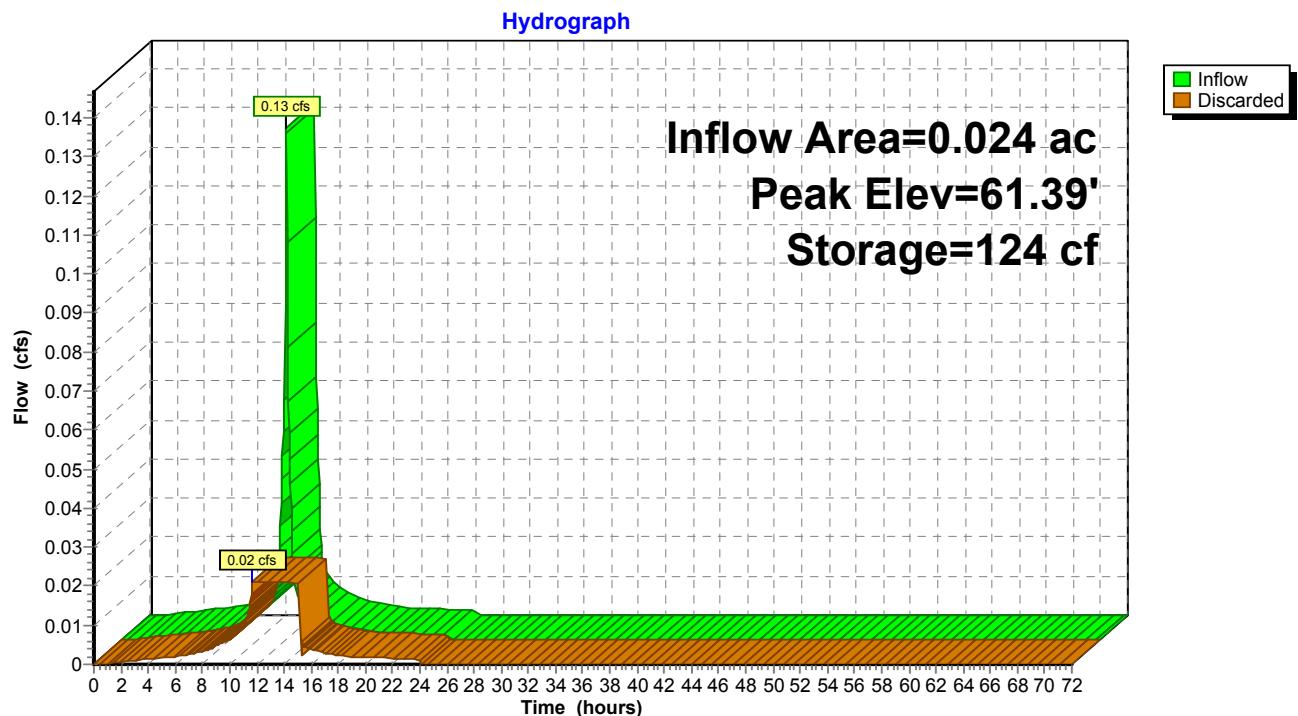
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P7: Infiltration Chambers

Summary for Pond P8: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.39' @ 12.56 hrs Surf.Area= 111 sf Storage= 124 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 31.4 min (777.3 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P8: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

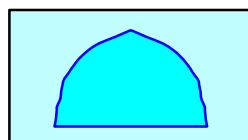
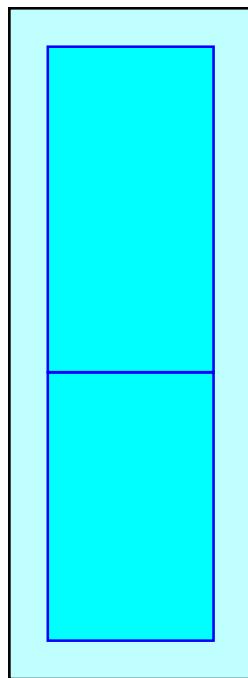
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

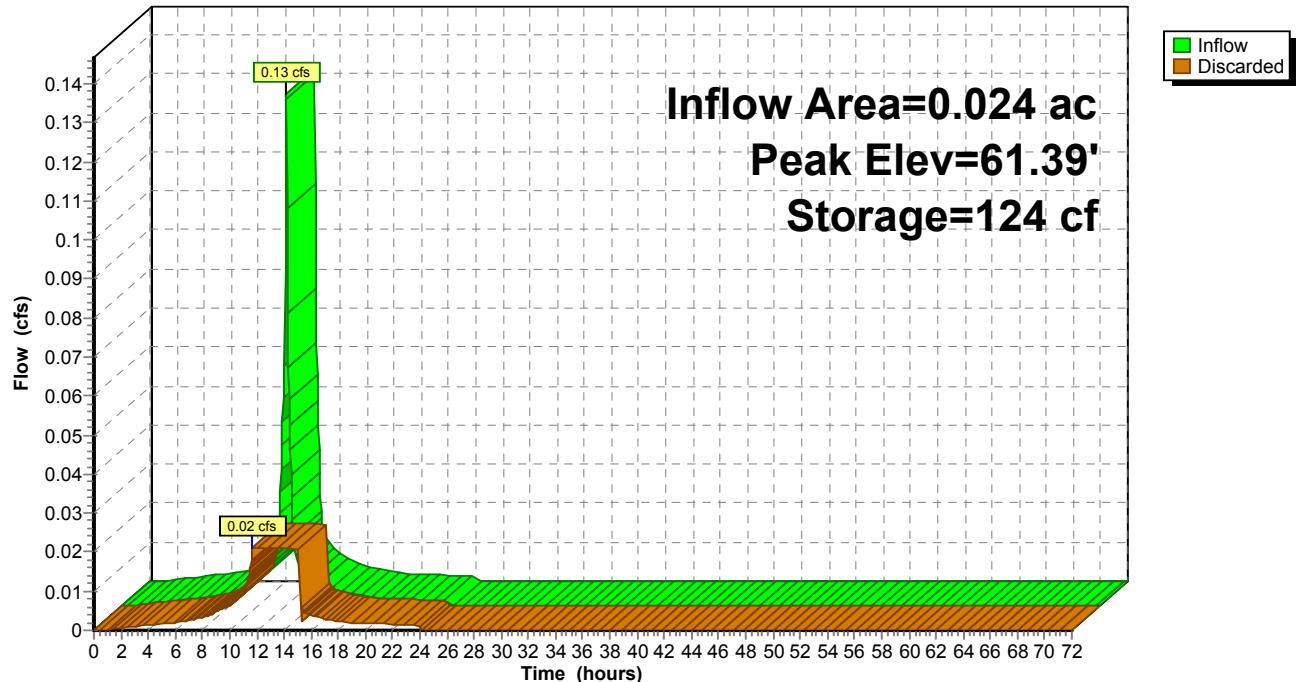
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P8: Infiltration Chambers**Hydrograph**

Summary for Pond P9: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 5.46" for 25-Year event
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.39' @ 12.56 hrs Surf.Area= 111 sf Storage= 124 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 31.4 min (777.4 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P9: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

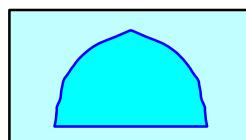
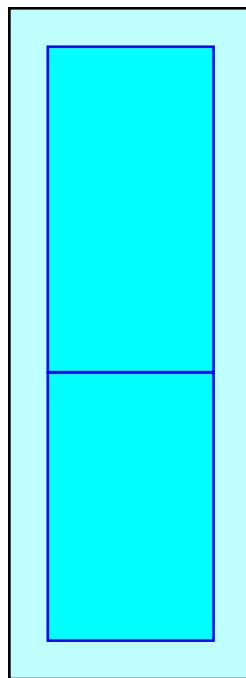
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

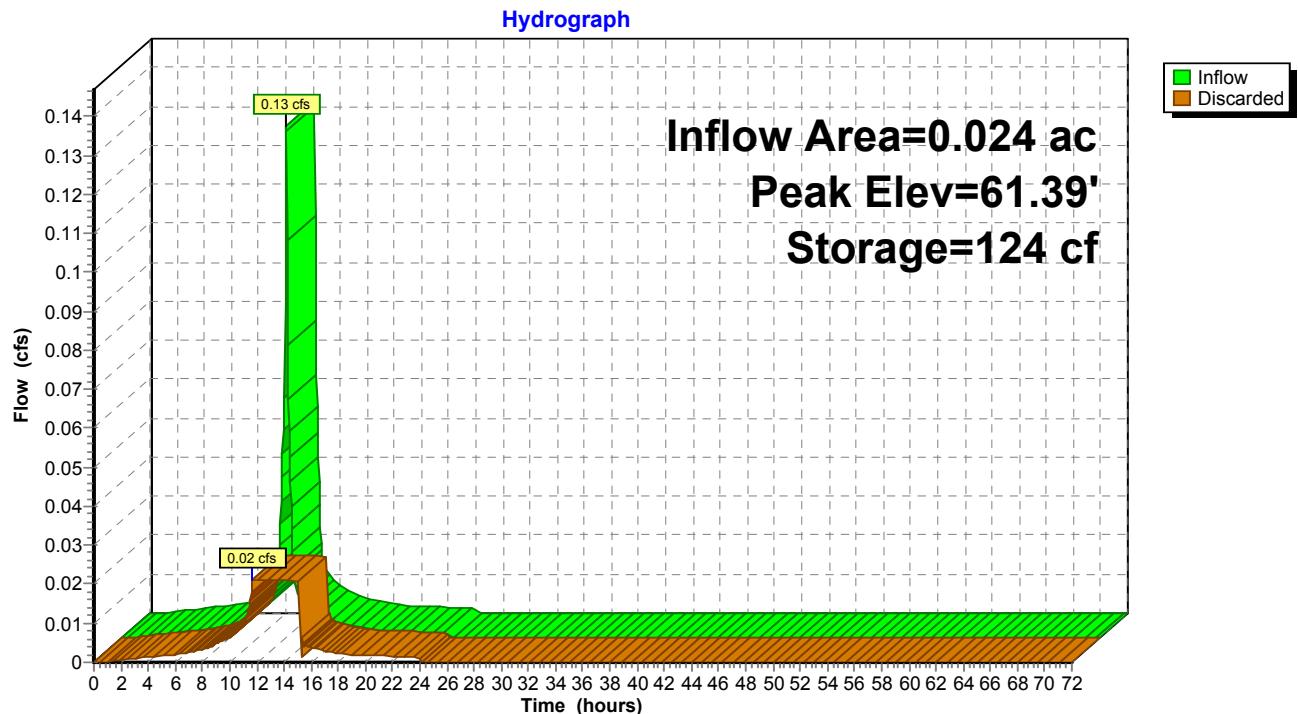
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P9: Infiltration Chambers

Summary for Pond W1: BVW

Inflow Area = 5.027 ac, 50.13% Impervious, Inflow Depth = 1.66" for 25-Year event
 Inflow = 2.93 cfs @ 12.10 hrs, Volume= 0.695 af
 Outflow = 2.91 cfs @ 12.11 hrs, Volume= 0.695 af, Atten= 1%, Lag= 0.8 min
 Primary = 2.91 cfs @ 12.11 hrs, Volume= 0.695 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 56.05' @ 12.11 hrs Surf.Area= 4,444 sf Storage= 192 cf

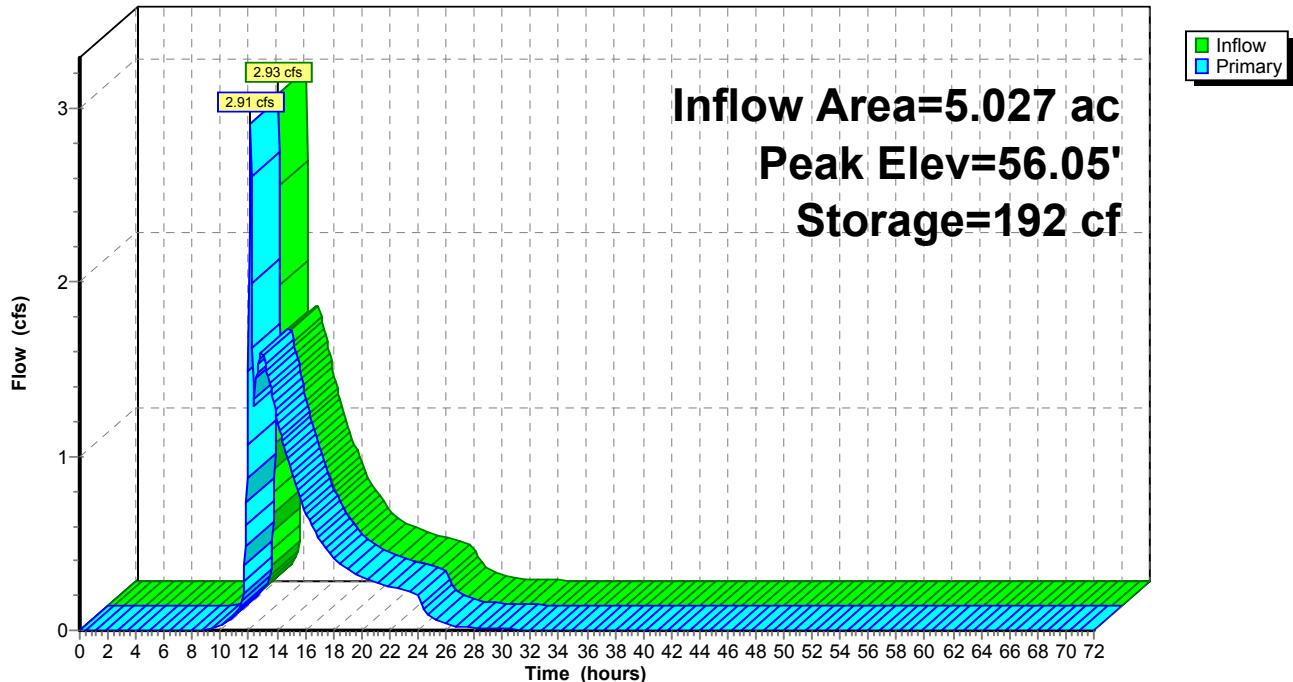
Plug-Flow detention time= 1.8 min calculated for 0.695 af (100% of inflow)
 Center-of-Mass det. time= 1.8 min (948.7 - 946.9)

Volume	Invert	Avail.Storage	Storage Description	
#1	56.00'	11,314 cf	Custom Stage Data (Irregular)	Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
56.00	3,962	413.1	0	0	3,962
57.00	20,884	797.8	11,314	11,314	41,037

Device	Routing	Invert	Outlet Devices	
#1	Primary	56.00'	120.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64	

Primary OutFlow Max=2.85 cfs @ 12.11 hrs HW=56.04' TW=0.00' (Dynamic Tailwater)
 ↑ 1=Broad-Crested Rectangular Weir (Weir Controls 2.85 cfs @ 0.53 fps)

Pond W1: BVW**Hydrograph**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Sub-1	Runoff Area=11,515 sf 47.75% Impervious Runoff Depth=3.39" Tc=6.0 min CN=67 Runoff=1.03 cfs 0.075 af
Subcatchment2S: Sub-2	Runoff Area=8,566 sf 7.82% Impervious Runoff Depth=1.20" Tc=6.0 min CN=44 Runoff=0.20 cfs 0.020 af
Subcatchment3A-10R: Roofs 15 B	Runoff Area=857 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-10R1: Roofs 15 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment3A-11R: Roofs 16-17 FB	Runoff Area=3,806 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.59 cfs 0.050 af
Subcatchment3A-12R: Roofs 18-21 F	Runoff Area=4,201 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.66 cfs 0.055 af
Subcatchment3A-12R1: Roofs 22-24 F	Runoff Area=3,124 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.49 cfs 0.041 af
Subcatchment3A-14R: Roofs 25-28 F	Runoff Area=4,152 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.65 cfs 0.054 af
Subcatchment3A-14R1: Roofs 29-30 B	Runoff Area=1,686 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.26 cfs 0.022 af
Subcatchment3A-14R2: Roofs 31-32 B	Runoff Area=1,707 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.27 cfs 0.022 af
Subcatchment3A-15R: Roofs 29-30 F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment3A-16R: Roofs 29-30 F	Runoff Area=1,057 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.17 cfs 0.014 af
Subcatchment3A-17R: Roofs 31-32 F	Runoff Area=1,043 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment3A-18R: Roofs 31-32 F	Runoff Area=1,041 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment3A-1R: Roof 5	Runoff Area=1,903 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.30 cfs 0.025 af
Subcatchment3A-2R: Roofs 1-4 FB	Runoff Area=7,608 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=1.19 cfs 0.100 af

27-135 Post-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

*Type III 24-hr 100-Year Rainfall=7.10"*Page 336

Subcatchment3A-2R1: Roofs 6-9 FB	Runoff Area=7,608 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=1.19 cfs 0.100 af
Subcatchment3A-3R: Roofs 10-F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment3A-4R: Roofs 11 F	Runoff Area=1,045 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment3A-5R: Roofs 10-11 B	Runoff Area=1,707 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.27 cfs 0.022 af
Subcatchment3A-6R: Roofs 12 B	Runoff Area=829 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af
Subcatchment3A-7R: Roofs 12 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment3A-8R: Roofs 13 F	Runoff Area=1,047 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment3A-9R: Roofs 14 F	Runoff Area=1,048 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.16 cfs 0.014 af
Subcatchment3A-S: Sub-3A	Runoff Area=160,799 sf 55.72% Impervious Runoff Depth=4.02" Tc=6.0 min CN=73 Runoff=17.06 cfs 1.237 af
Subcatchment3B-S: Sub-3B	Runoff Area=42,013 sf 40.23% Impervious Runoff Depth=3.81" Tc=6.0 min CN=71 Runoff=4.22 cfs 0.306 af
Subcatchment3C-S: Sub-3C	Runoff Area=16,169 sf 20.21% Impervious Runoff Depth=2.28" Tc=6.0 min CN=56 Runoff=0.93 cfs 0.071 af
Subcatchment4S-1: Sub-4	Runoff Area=11,741 sf 37.46% Impervious Runoff Depth=2.77" Tc=6.0 min CN=61 Runoff=0.84 cfs 0.062 af
Subcatchment4S-1R: Roofs 22-24 B	Runoff Area=2,596 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.41 cfs 0.034 af
Subcatchment4S-2: Sub-4	Runoff Area=3,394 sf 9.16% Impervious Runoff Depth=1.20" Tc=6.0 min CN=44 Runoff=0.08 cfs 0.008 af
Subcatchment5S: Sub -5	Runoff Area=13,253 sf 9.23% Impervious Runoff Depth=1.28" Tc=6.0 min CN=45 Runoff=0.35 cfs 0.033 af
Subcatchment5S-1R: Roofs 18-21 B	Runoff Area=3,407 sf 100.00% Impervious Runoff Depth=6.86" Tc=6.0 min CN=98 Runoff=0.53 cfs 0.045 af
Reach DP-1: DMH	Inflow=1.03 cfs 0.075 af Outflow=1.03 cfs 0.075 af

Reach DP-2: DP-2	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach DP-3: DP-3	Inflow=5.45 cfs 1.150 af Outflow=5.45 cfs 1.150 af
Reach DP-4: PL	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach DP-5: PL	Inflow=0.35 cfs 0.033 af Outflow=0.35 cfs 0.033 af
Pond D-1: Depression	Peak Elev=59.19' Storage=87 cf Inflow=0.20 cfs 0.020 af Discarded=0.09 cfs 0.020 af Primary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.020 af
Pond D-2: Depression	Peak Elev=58.90' Storage=788 cf Inflow=0.93 cfs 0.071 af Discarded=0.20 cfs 0.071 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.071 af
Pond D-3: Depression	Peak Elev=64.36' Storage=1,590 cf Inflow=0.84 cfs 0.062 af Discarded=0.03 cfs 0.062 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.062 af
Pond D-4: Depression	Peak Elev=59.45' Storage=339 cf Inflow=0.08 cfs 0.008 af Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Pond DB-1: Prop Detention Basin	Peak Elev=60.97' Storage=25,214 cf Inflow=17.06 cfs 1.237 af Outflow=4.00 cfs 0.844 af
Pond P1: Infiltration Chambers	Peak Elev=58.67' Storage=318 cf Inflow=0.30 cfs 0.025 af Outflow=0.04 cfs 0.025 af
Pond P10: Infiltration Chambers	Peak Elev=62.06' Storage=317 cf Inflow=0.30 cfs 0.025 af Outflow=0.04 cfs 0.025 af
Pond P11: Infiltration Chambers	Peak Elev=66.46' Storage=686 cf Inflow=0.59 cfs 0.050 af Outflow=0.06 cfs 0.050 af
Pond P12: Infiltration Chambers	Peak Elev=57.83' Storage=1,078 cf Inflow=1.14 cfs 0.096 af Outflow=0.19 cfs 0.096 af
Pond P13: Infiltration Chambers	Peak Elev=57.44' Storage=778 cf Inflow=0.94 cfs 0.079 af Outflow=0.19 cfs 0.079 af
Pond P14: Infiltration Chambers	Peak Elev=61.67' Storage=1,356 cf Inflow=1.18 cfs 0.099 af Outflow=0.13 cfs 0.099 af
Pond P15: Infiltration Chambers	Peak Elev=62.08' Storage=174 cf Inflow=0.16 cfs 0.014 af Outflow=0.02 cfs 0.014 af
Pond P16: Infiltration Chambers	Peak Elev=62.12' Storage=176 cf Inflow=0.17 cfs 0.014 af Outflow=0.02 cfs 0.014 af

27-135 Post-Development Final (R1-1)

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-14 s/n 00452 © 2015 HydroCAD Software Solutions LLC

*Type III 24-hr 100-Year Rainfall=7.10"*Page 338**Pond P17: Infiltration Chambers**Peak Elev=62.07' Storage=172 cf Inflow=0.16 cfs 0.014 af
Outflow=0.02 cfs 0.014 af**Pond P18: Infiltration Chambers**Peak Elev=62.06' Storage=172 cf Inflow=0.16 cfs 0.014 af
Outflow=0.02 cfs 0.014 af**Pond P2: Infiltration Chambers**Peak Elev=59.01' Storage=2,693 cf Inflow=2.38 cfs 0.200 af
Outflow=0.27 cfs 0.200 af**Pond P3: Infiltration Chambers**Peak Elev=58.68' Storage=174 cf Inflow=0.16 cfs 0.014 af
Outflow=0.02 cfs 0.014 af**Pond P4: Infiltration Chambers**Peak Elev=58.67' Storage=173 cf Inflow=0.16 cfs 0.014 af
Outflow=0.02 cfs 0.014 af**Pond P5: Infiltration Chambers**Peak Elev=58.58' Storage=264 cf Inflow=0.27 cfs 0.022 af
Outflow=0.04 cfs 0.022 af**Pond P6: Infiltration Chambers**Peak Elev=61.60' Storage=122 cf Inflow=0.13 cfs 0.011 af
Outflow=0.02 cfs 0.011 af**Pond P7: Infiltration Chambers**Peak Elev=62.08' Storage=173 cf Inflow=0.16 cfs 0.014 af
Outflow=0.02 cfs 0.014 af**Pond P8: Infiltration Chambers**Peak Elev=62.08' Storage=173 cf Inflow=0.16 cfs 0.014 af
Outflow=0.02 cfs 0.014 af**Pond P9: Infiltration Chambers**Peak Elev=62.08' Storage=174 cf Inflow=0.16 cfs 0.014 af
Outflow=0.02 cfs 0.014 af**Pond W1: BVW**Peak Elev=56.07' Storage=300 cf Inflow=5.45 cfs 1.150 af
Outflow=5.45 cfs 1.150 af**Total Runoff Area = 7.418 ac Runoff Volume = 2.541 af Average Runoff Depth = 4.11"**
45.06% Pervious = 3.342 ac 54.94% Impervious = 4.076 ac

Summary for Subcatchment 1S: Sub-1

Runoff = 1.03 cfs @ 12.09 hrs, Volume= 0.075 af, Depth= 3.39"

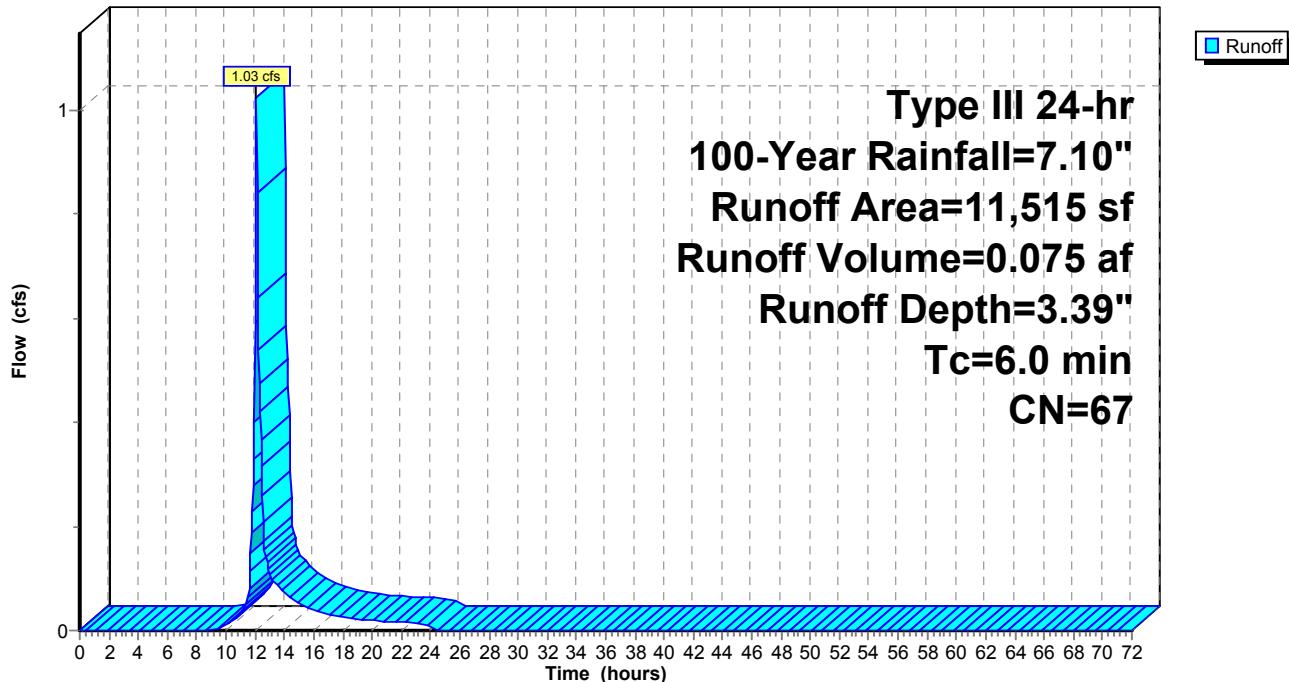
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
* 5,498	98	Paved roads w/curbs & sewers, HSG A
6,017	39	>75% Grass cover, Good, HSG A
11,515	67	Weighted Average
6,017		52.25% Pervious Area
5,498		47.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 1S: Sub-1

Hydrograph



Summary for Subcatchment 2S: Sub-2

Runoff = 0.20 cfs @ 12.12 hrs, Volume= 0.020 af, Depth= 1.20"

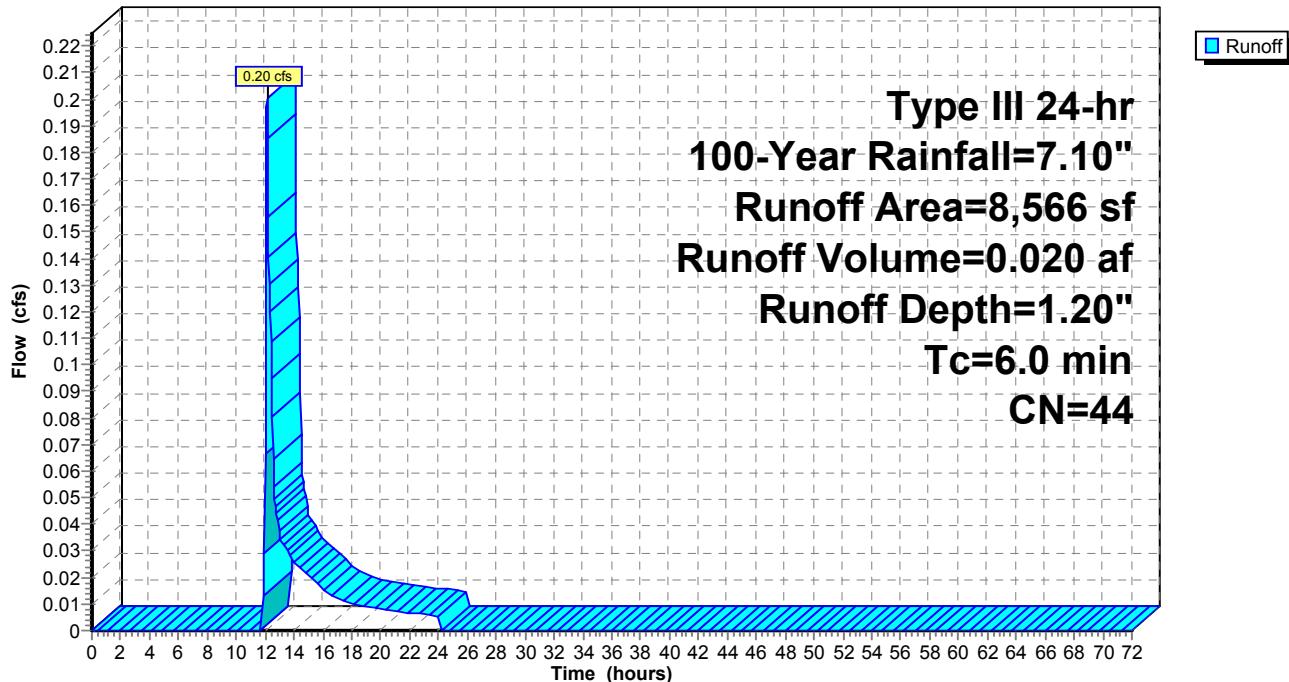
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
7,754	39	>75% Grass cover, Good, HSG A
*	100	Walls, HSG A
*	570	Decks, HSG A
142	39	>75% Grass cover, Good, HSG A
8,566	44	Weighted Average
7,896		92.18% Pervious Area
670		7.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 2S: Sub-2

Hydrograph



Summary for Subcatchment 3A-10R: Roofs 15 B

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 6.86"

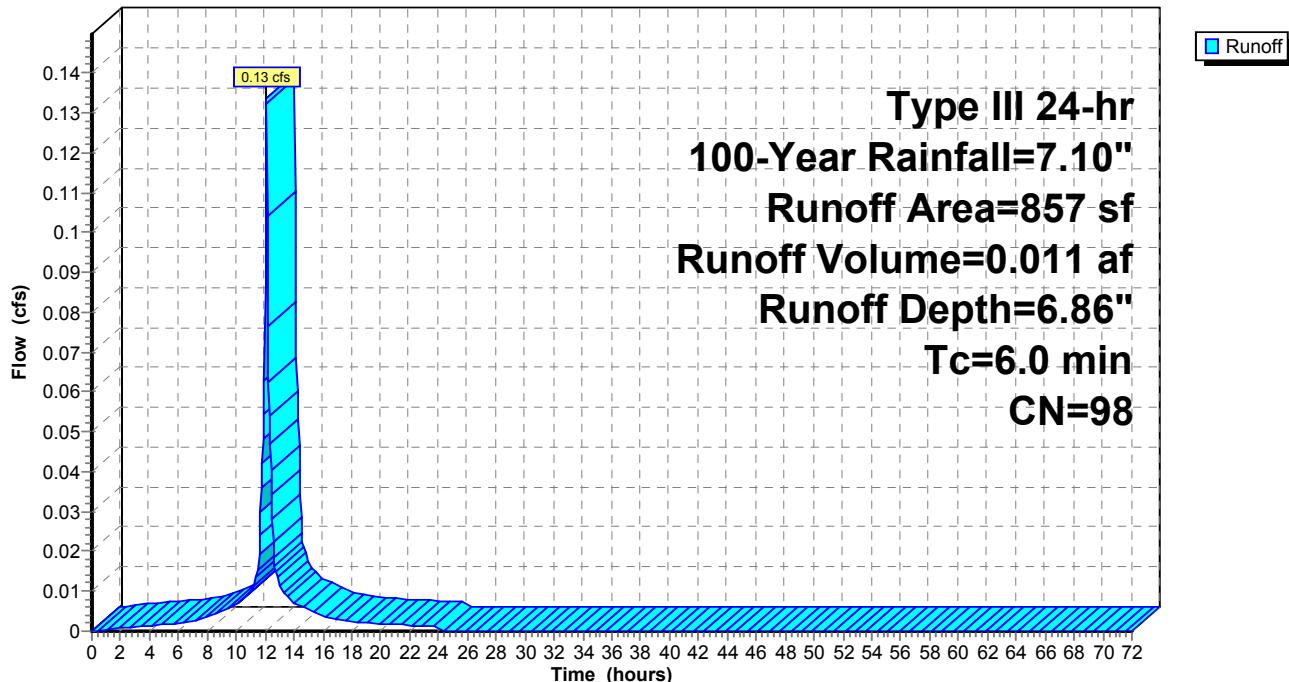
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
857	98	Roofs, HSG A
857		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-10R: Roofs 15 B

Hydrograph



Summary for Subcatchment 3A-10R1: Roofs 15 F

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 6.86"

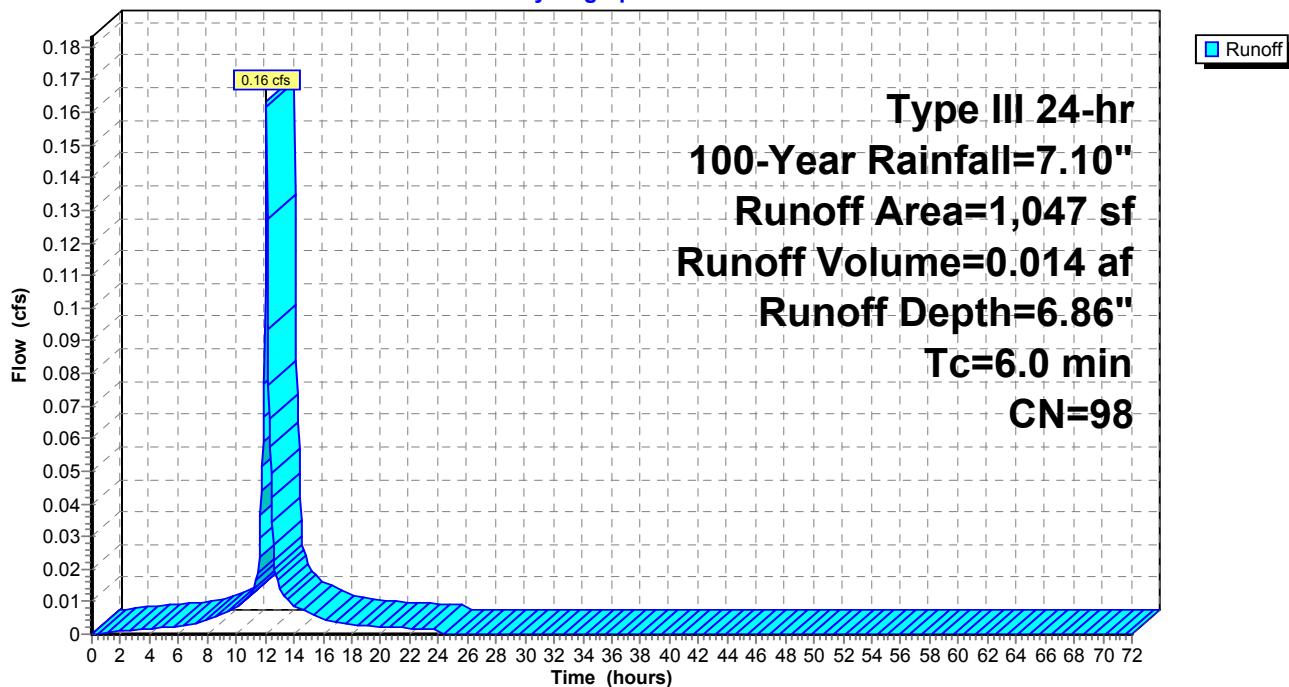
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
1,047	98	Roofs, HSG A
1,047		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-10R1: Roofs 15 F

Hydrograph



Summary for Subcatchment 3A-11R: Roofs 16-17 FB

Runoff = 0.59 cfs @ 12.09 hrs, Volume= 0.050 af, Depth= 6.86"

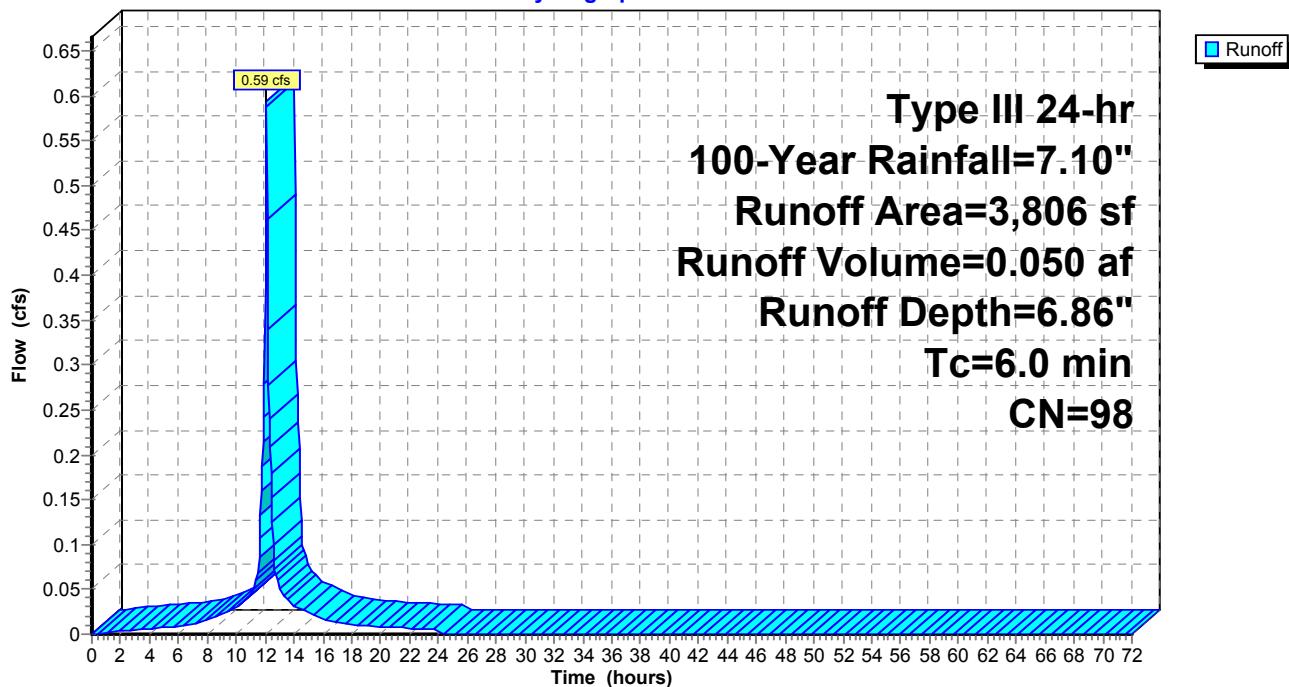
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
3,806	98	Roofs, HSG A
3,806		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-11R: Roofs 16-17 FB

Hydrograph



Summary for Subcatchment 3A-12R: Roofs 18-21 F

Runoff = 0.66 cfs @ 12.09 hrs, Volume= 0.055 af, Depth= 6.86"

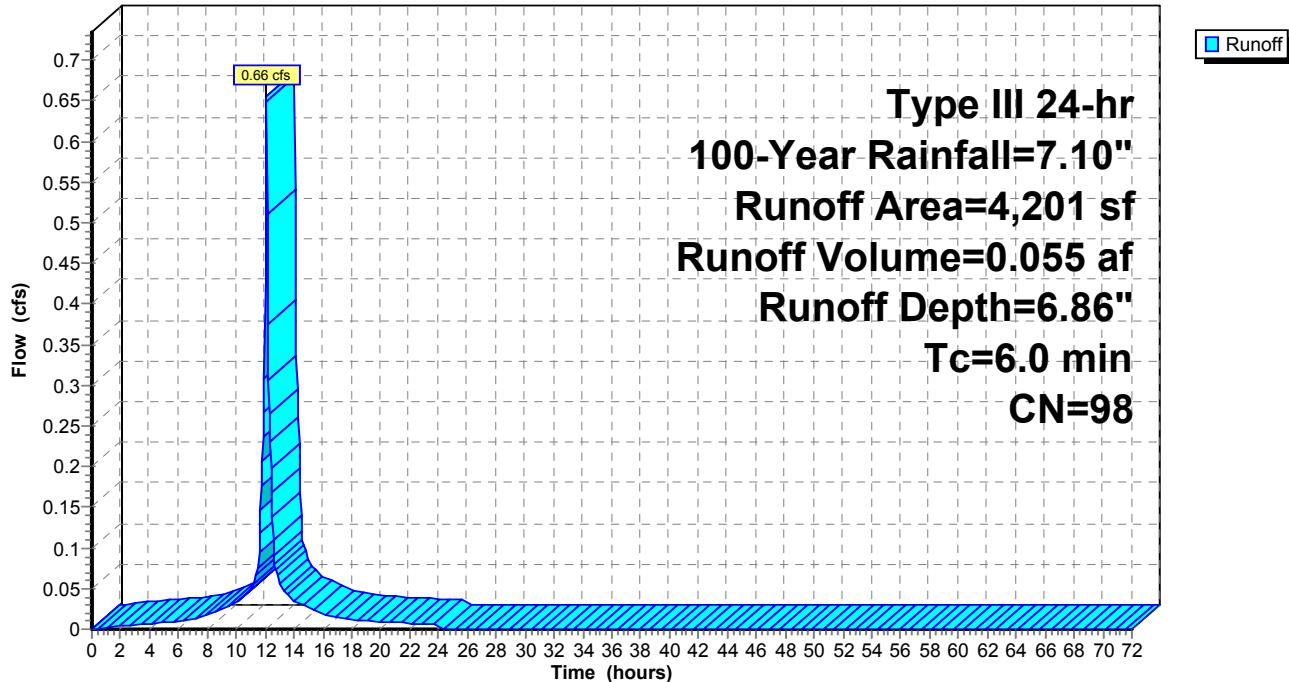
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
4,201	98	Roofs, HSG A
4,201		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-12R: Roofs 18-21 F

Hydrograph



Summary for Subcatchment 3A-12R1: Roofs 22-24 F

Runoff = 0.49 cfs @ 12.09 hrs, Volume= 0.041 af, Depth= 6.86"

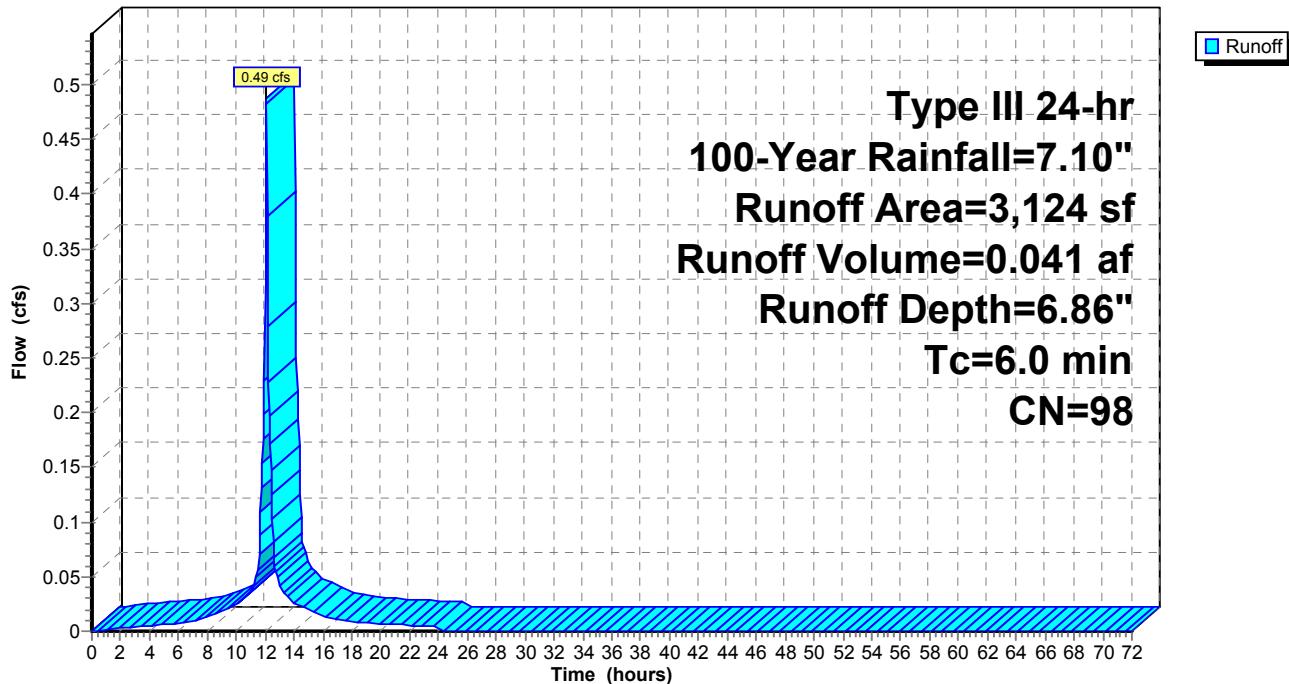
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
3,124	98	Roofs, HSG A
3,124		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-12R1: Roofs 22-24 F

Hydrograph



Summary for Subcatchment 3A-14R: Roofs 25-28 F

Runoff = 0.65 cfs @ 12.09 hrs, Volume= 0.054 af, Depth= 6.86"

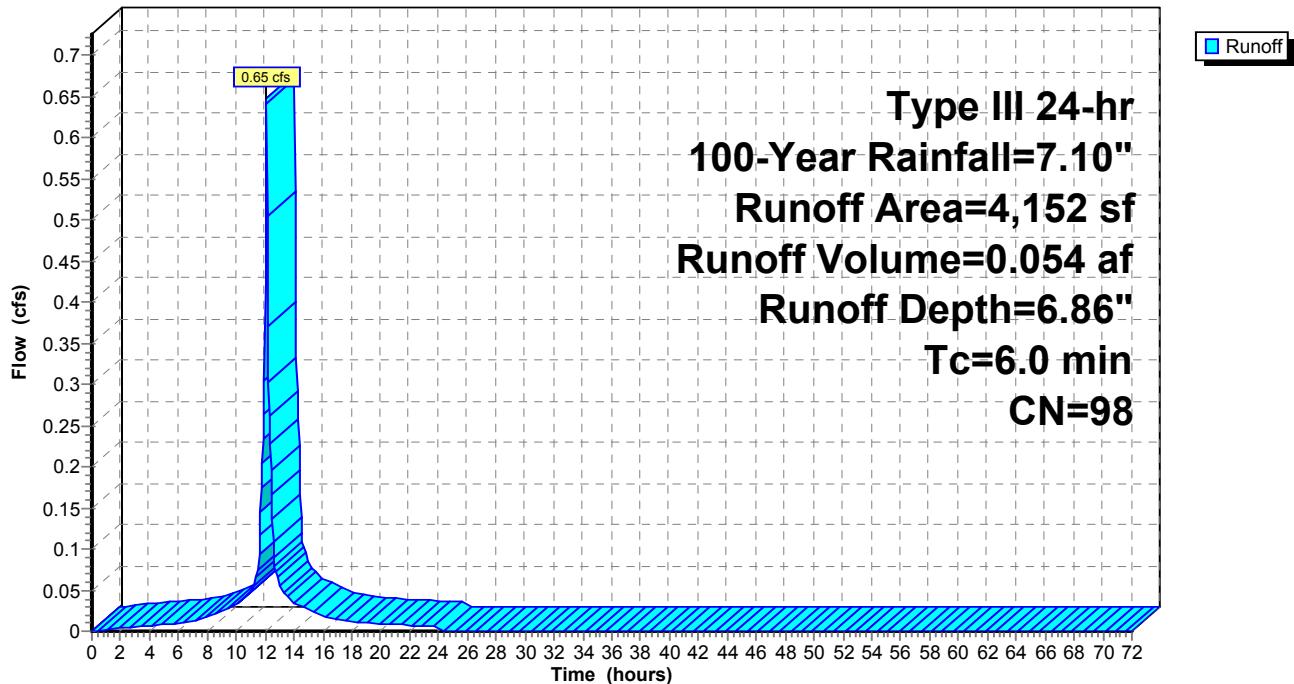
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
4,152	98	Roofs, HSG A
4,152		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R: Roofs 25-28 F

Hydrograph



Summary for Subcatchment 3A-14R1: Roofs 29-30 B

Runoff = 0.26 cfs @ 12.09 hrs, Volume= 0.022 af, Depth= 6.86"

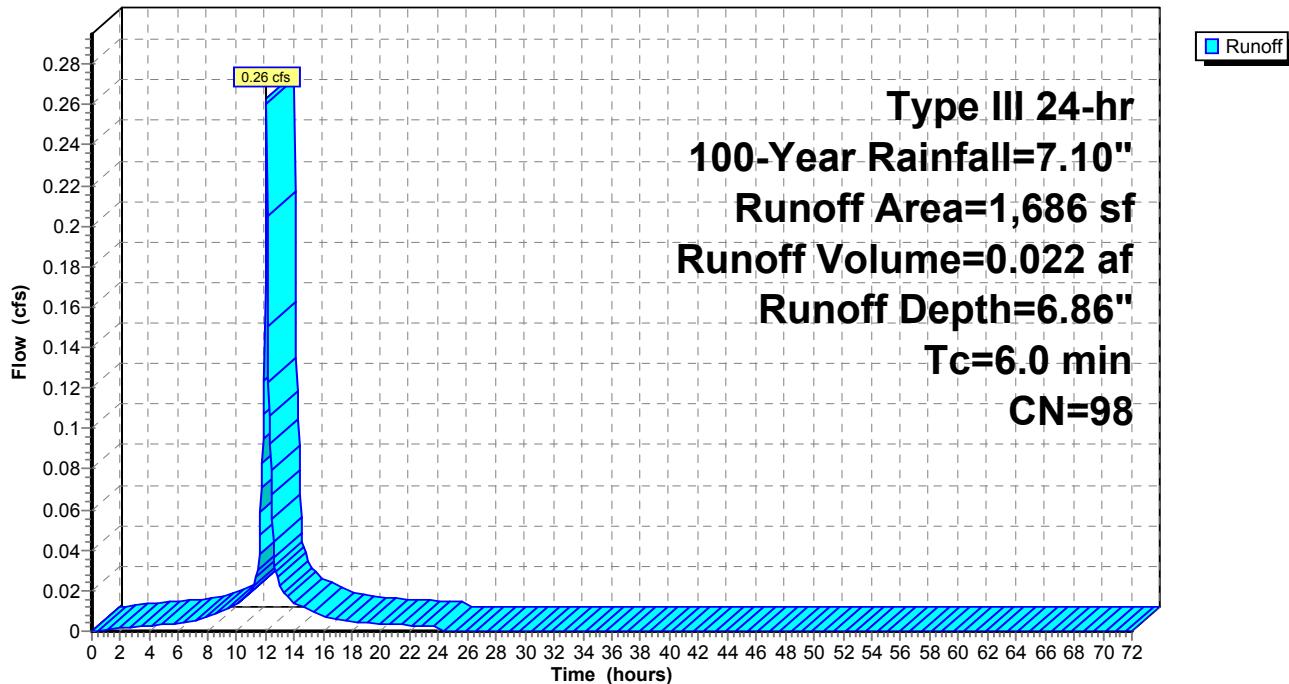
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
1,686	98	Roofs, HSG A
1,686		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R1: Roofs 29-30 B

Hydrograph



Summary for Subcatchment 3A-14R2: Roofs 31-32 B

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 0.022 af, Depth= 6.86"

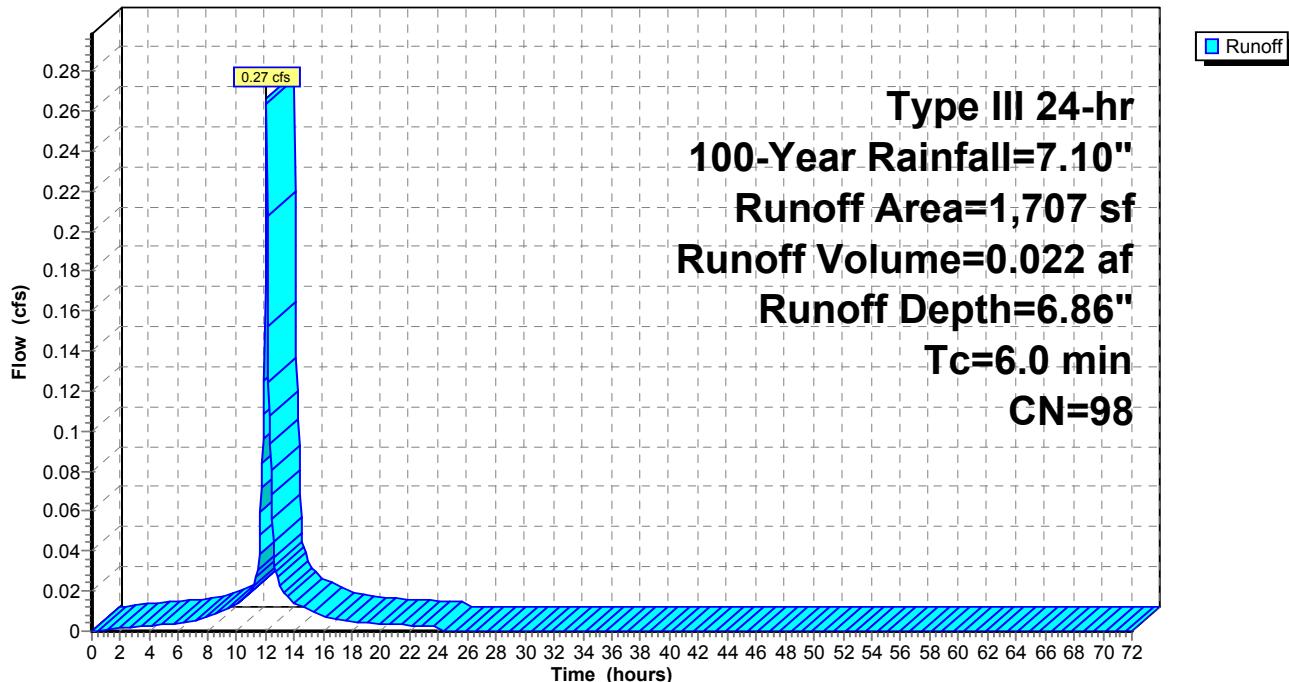
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
1,707	98	Roofs, HSG A
1,707		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-14R2: Roofs 31-32 B

Hydrograph



Summary for Subcatchment 3A-15R: Roofs 29-30 F

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 6.86"

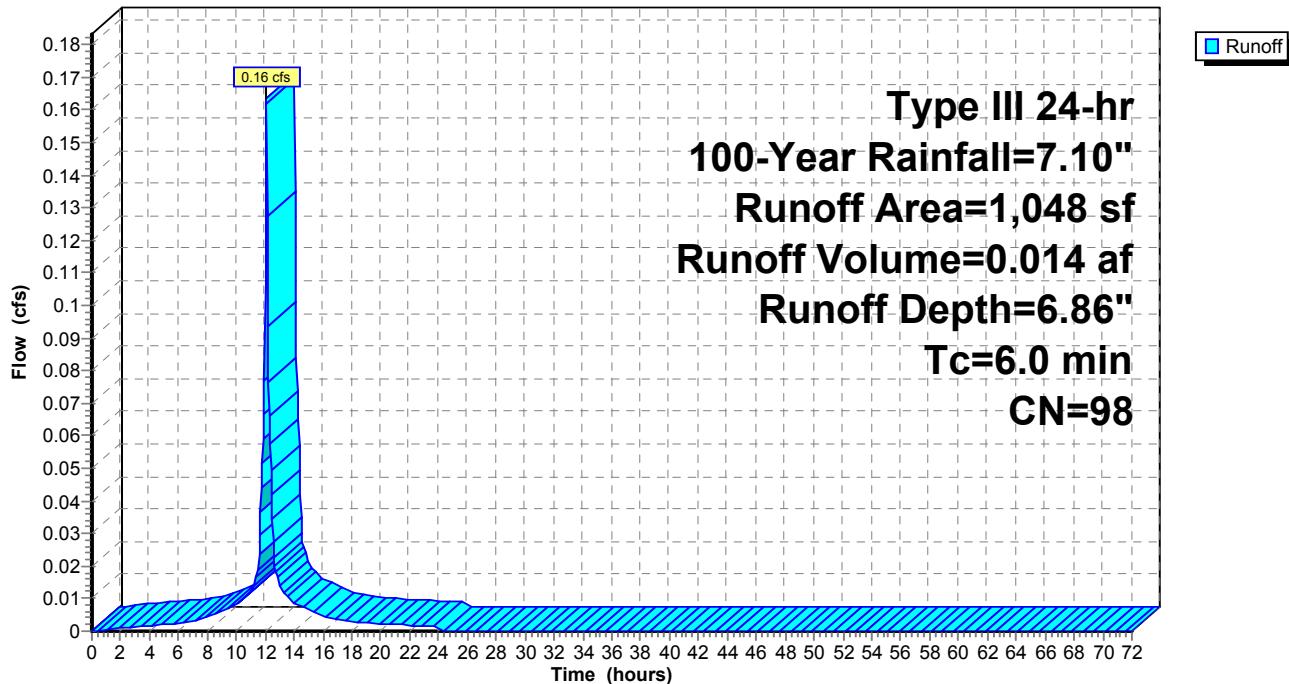
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
1,048	98	Roofs, HSG A
1,048		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-15R: Roofs 29-30 F

Hydrograph



Summary for Subcatchment 3A-16R: Roofs 29-30 F

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 6.86"

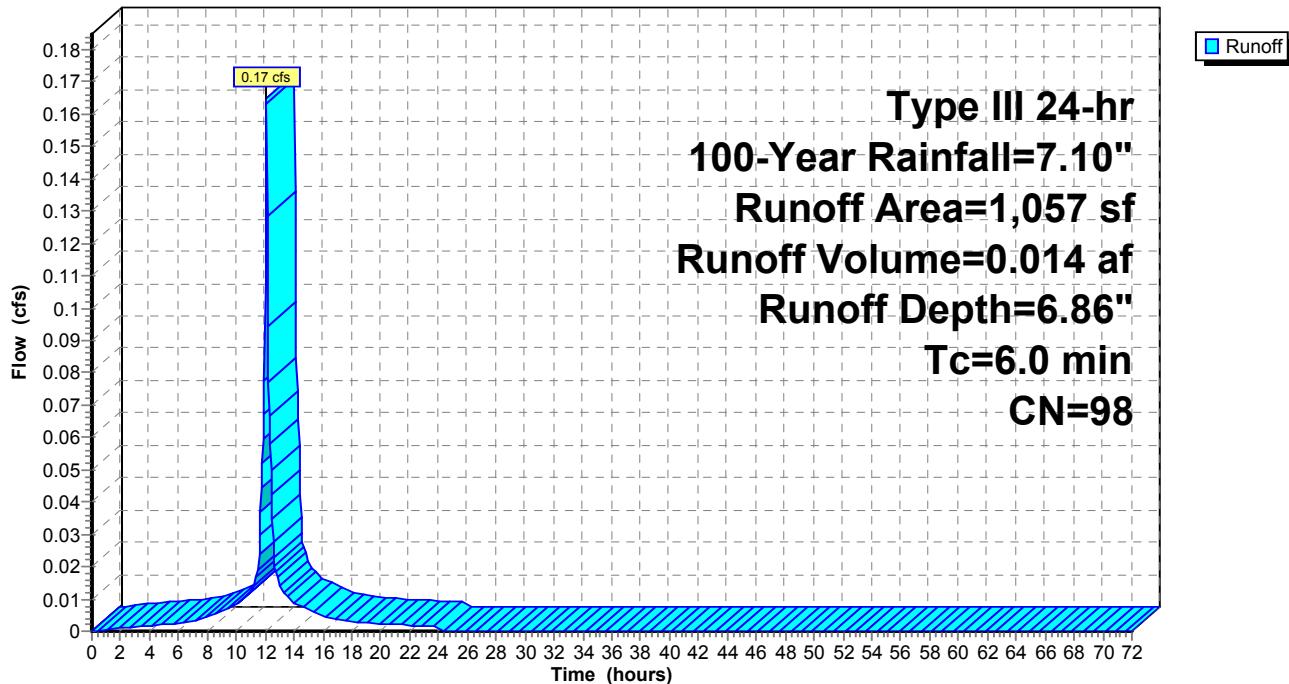
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
1,057	98	Roofs, HSG A
1,057		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-16R: Roofs 29-30 F

Hydrograph



Summary for Subcatchment 3A-17R: Roofs 31-32 F

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 6.86"

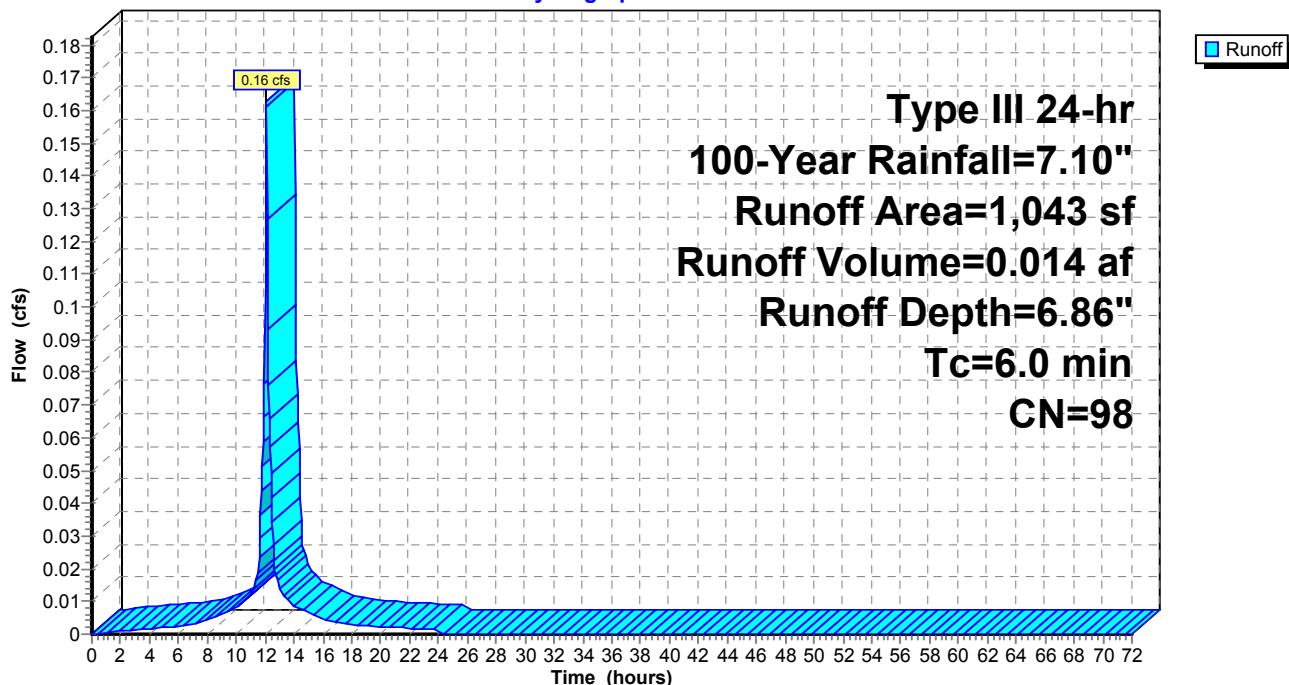
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
1,043	98	Roofs, HSG A
1,043		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-17R: Roofs 31-32 F

Hydrograph



Summary for Subcatchment 3A-18R: Roofs 31-32 F

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 6.86"

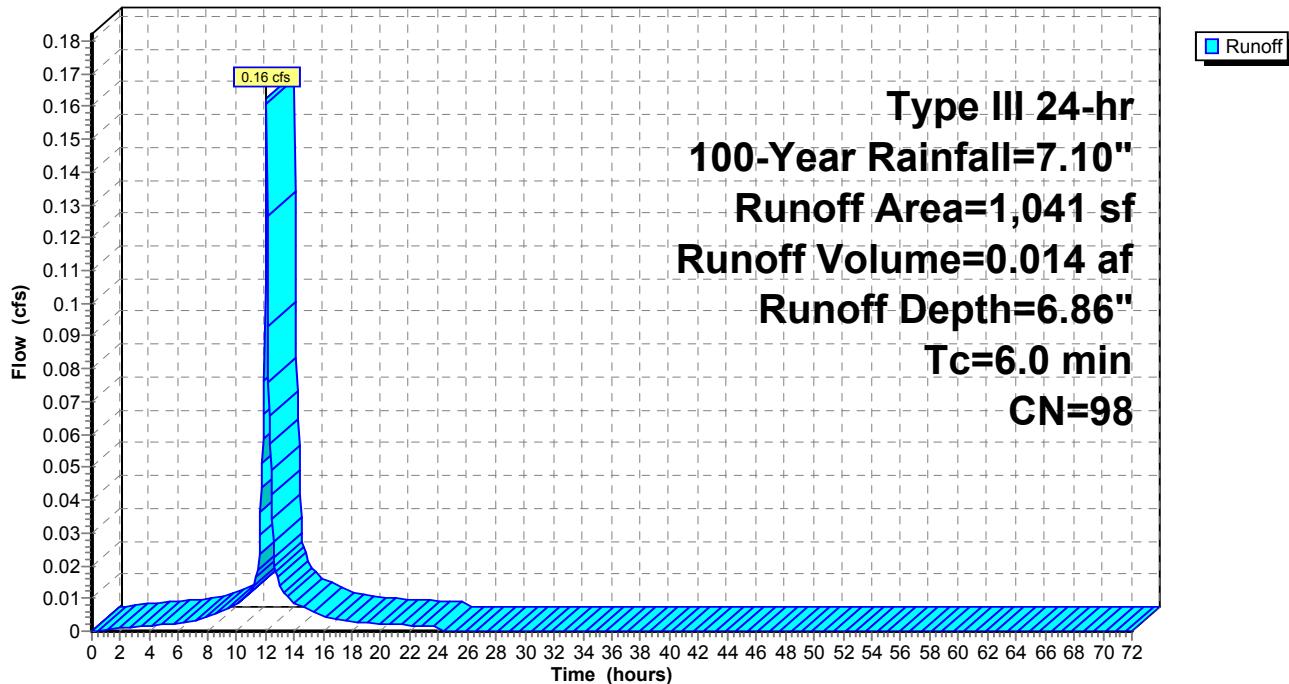
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
1,041	98	Roofs, HSG A
1,041		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-18R: Roofs 31-32 F

Hydrograph



Summary for Subcatchment 3A-1R: Roof 5

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.025 af, Depth= 6.86"

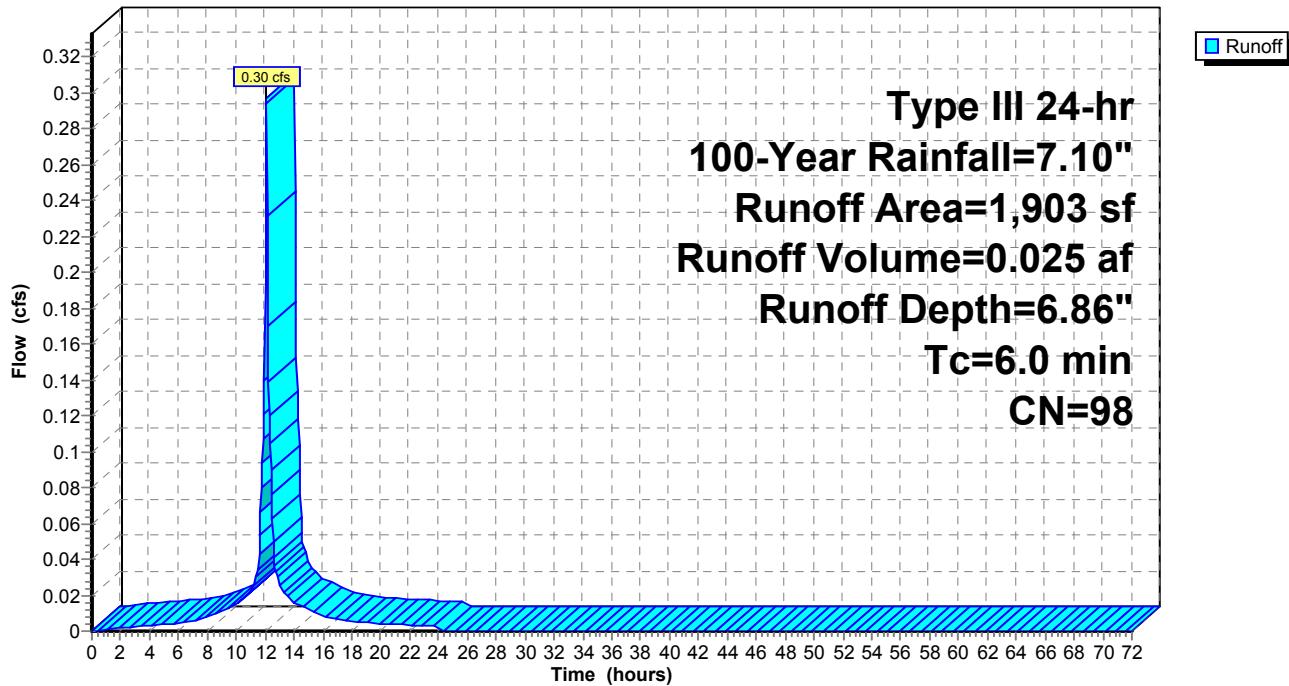
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
690	98	Roofs, HSG A
*	1,213	Roofs, HSG B
1,903	98	Weighted Average
1,903		100.00% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0				Direct Entry,

Subcatchment 3A-1R: Roof 5

Hydrograph



Summary for Subcatchment 3A-2R: Roofs 1-4 FB

Runoff = 1.19 cfs @ 12.09 hrs, Volume= 0.100 af, Depth= 6.86"

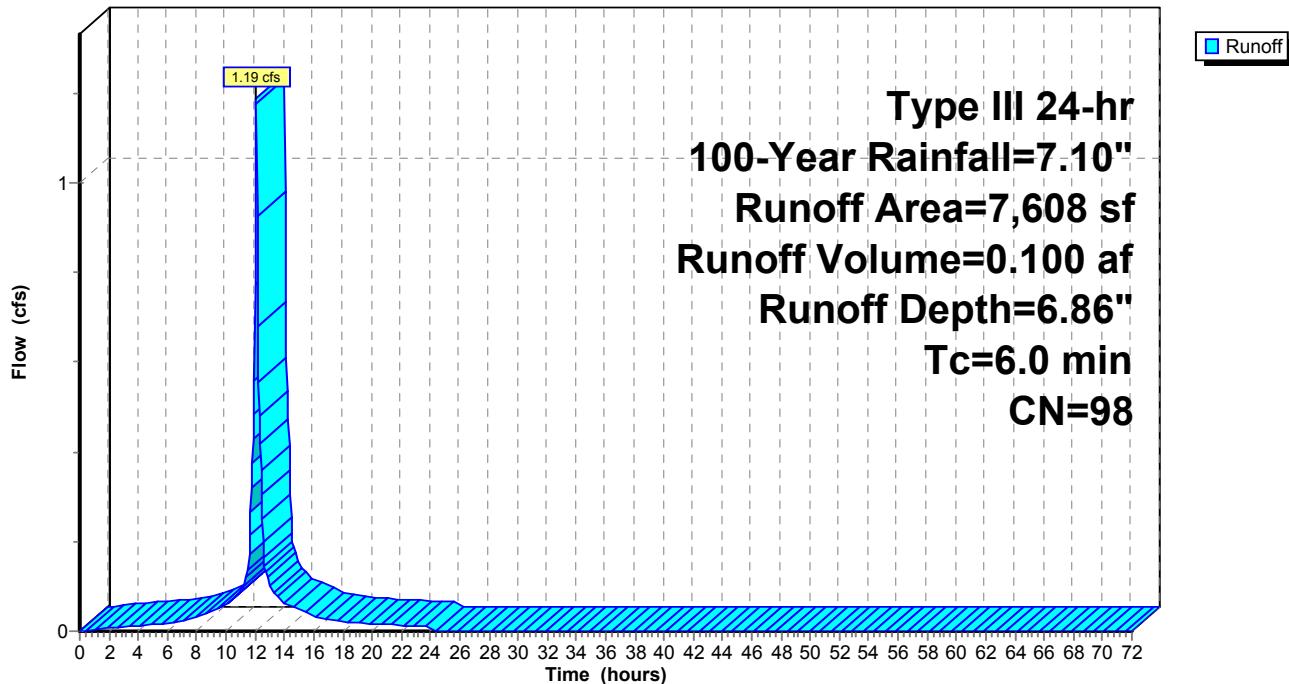
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
7,608	98	Roofs, HSG A
7,608		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-2R: Roofs 1-4 FB

Hydrograph



Summary for Subcatchment 3A-2R1: Roofs 6-9 FB

Runoff = 1.19 cfs @ 12.09 hrs, Volume= 0.100 af, Depth= 6.86"

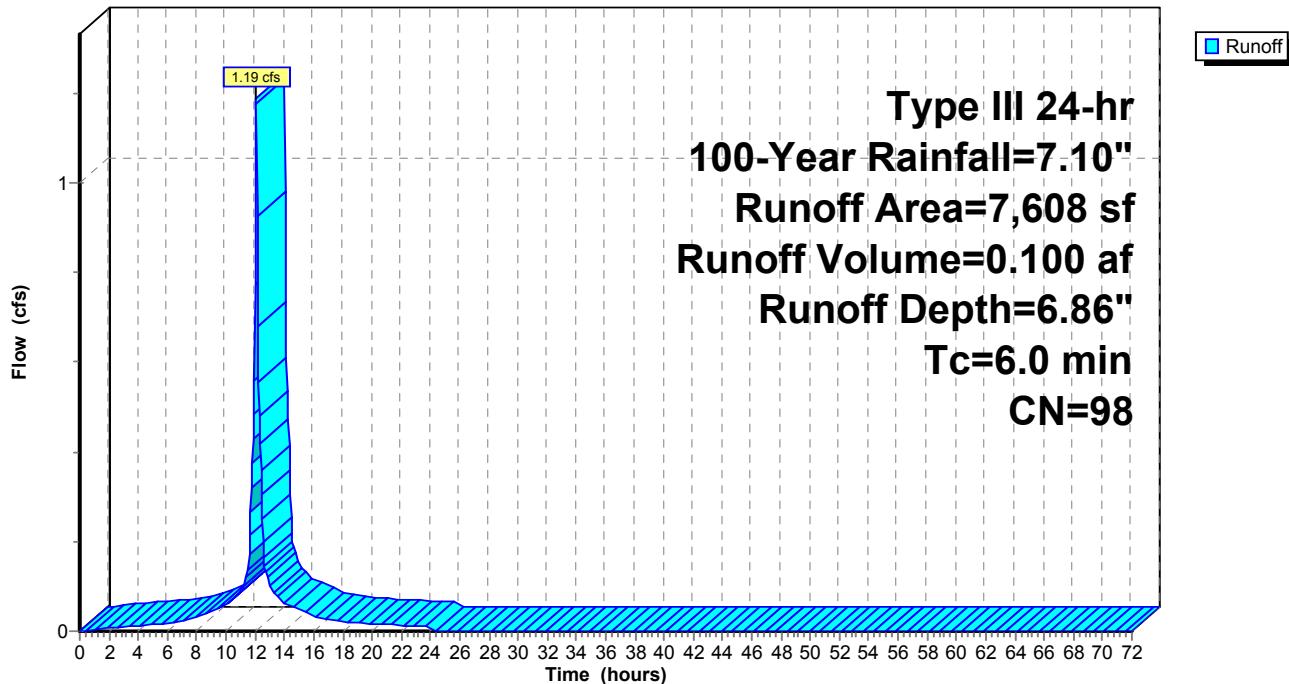
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
7,608	98	Roofs, HSG A
7,608		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-2R1: Roofs 6-9 FB

Hydrograph



Summary for Subcatchment 3A-3R: Roofs 10-F

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 6.86"

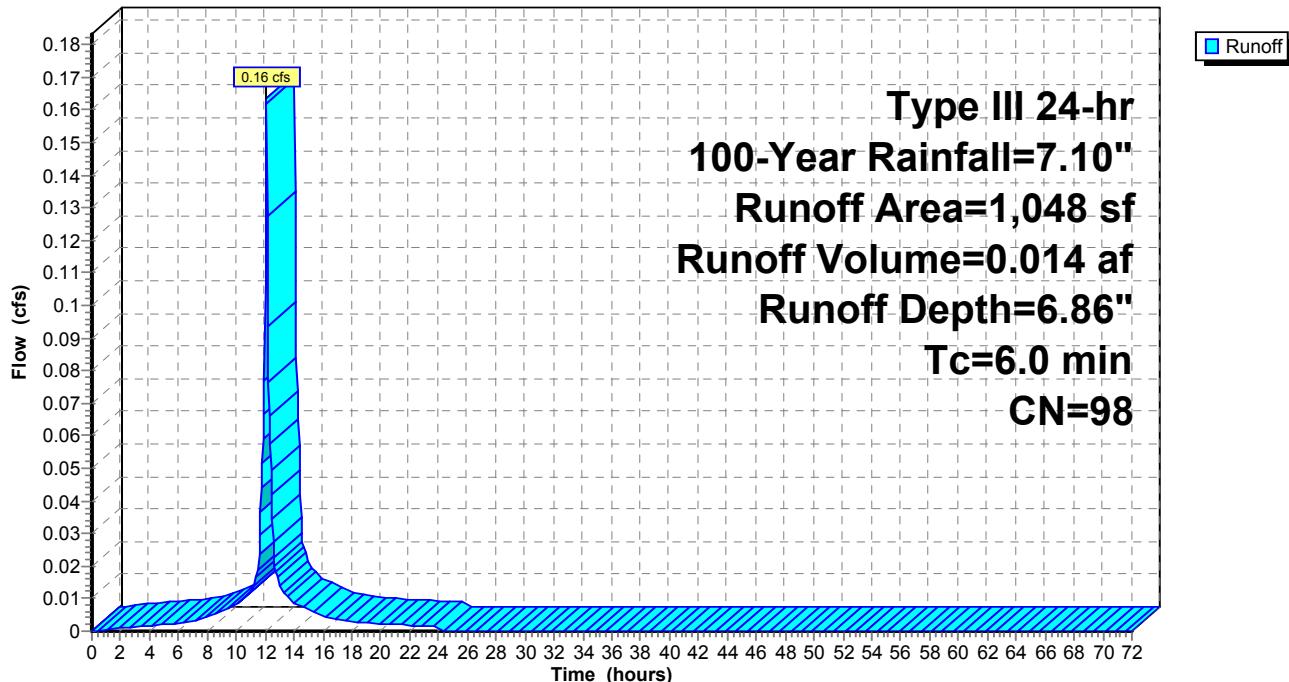
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	1,048	98	Roofs, HSG B
	1,048		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-3R: Roofs 10-F

Hydrograph



Summary for Subcatchment 3A-4R: Roofs 11 F

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 6.86"

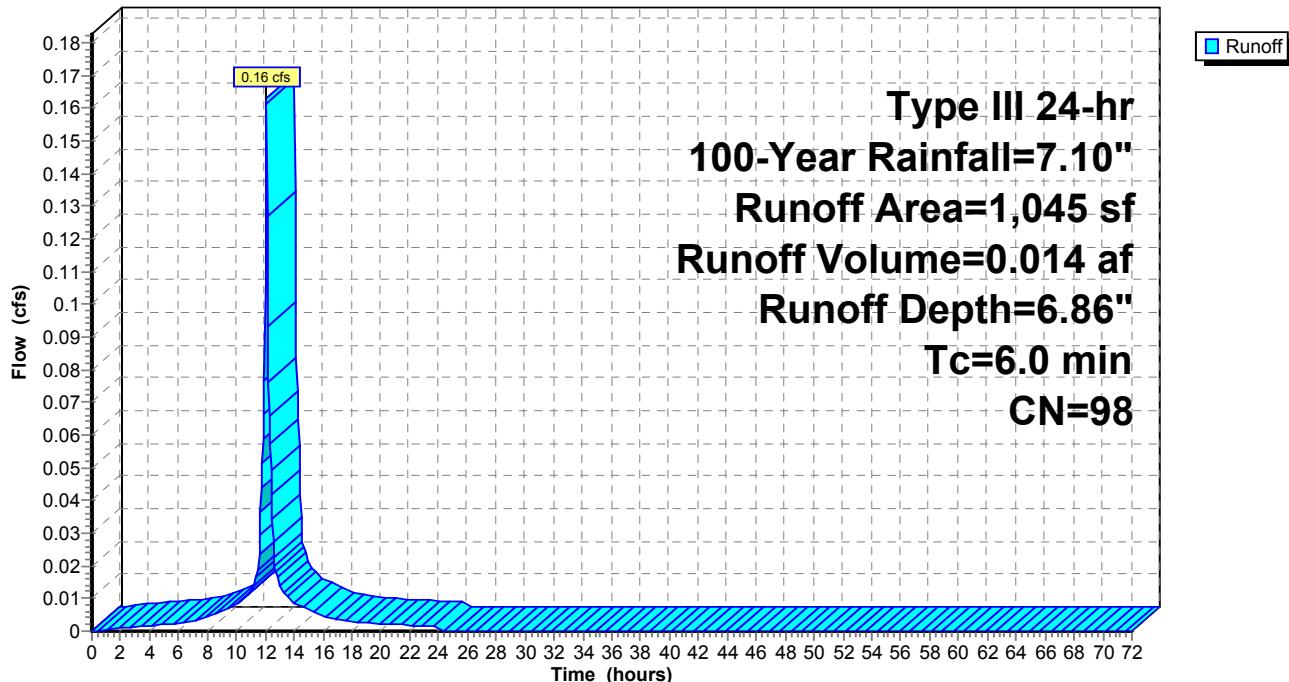
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	1,045	98	Roofs, HSG B
	1,045		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-4R: Roofs 11 F

Hydrograph



Summary for Subcatchment 3A-5R: Roofs 10-11 B

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 0.022 af, Depth= 6.86"

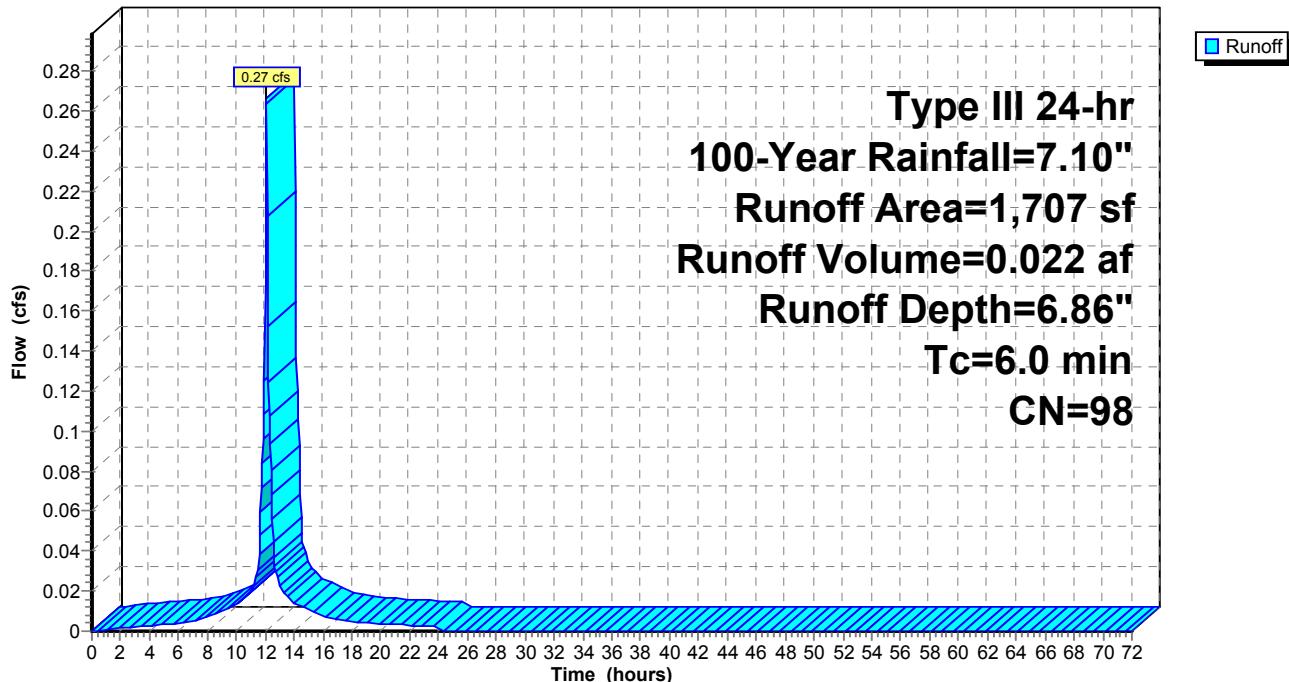
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	1,707	98	Roofs, HSG B
	1,707		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-5R: Roofs 10-11 B

Hydrograph



Summary for Subcatchment 3A-6R: Roofs 12 B

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 6.86"

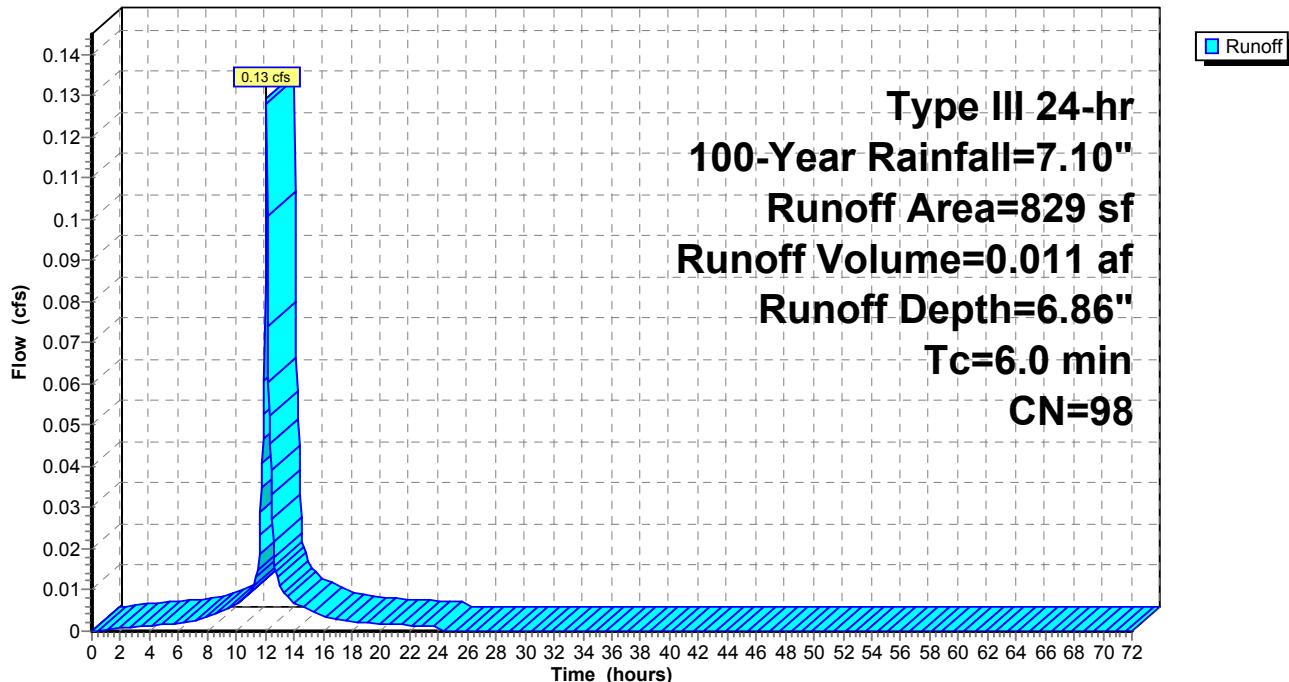
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	829	98	Roofs, HSG B
	829		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-6R: Roofs 12 B

Hydrograph



Summary for Subcatchment 3A-7R: Roofs 12 F

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 6.86"

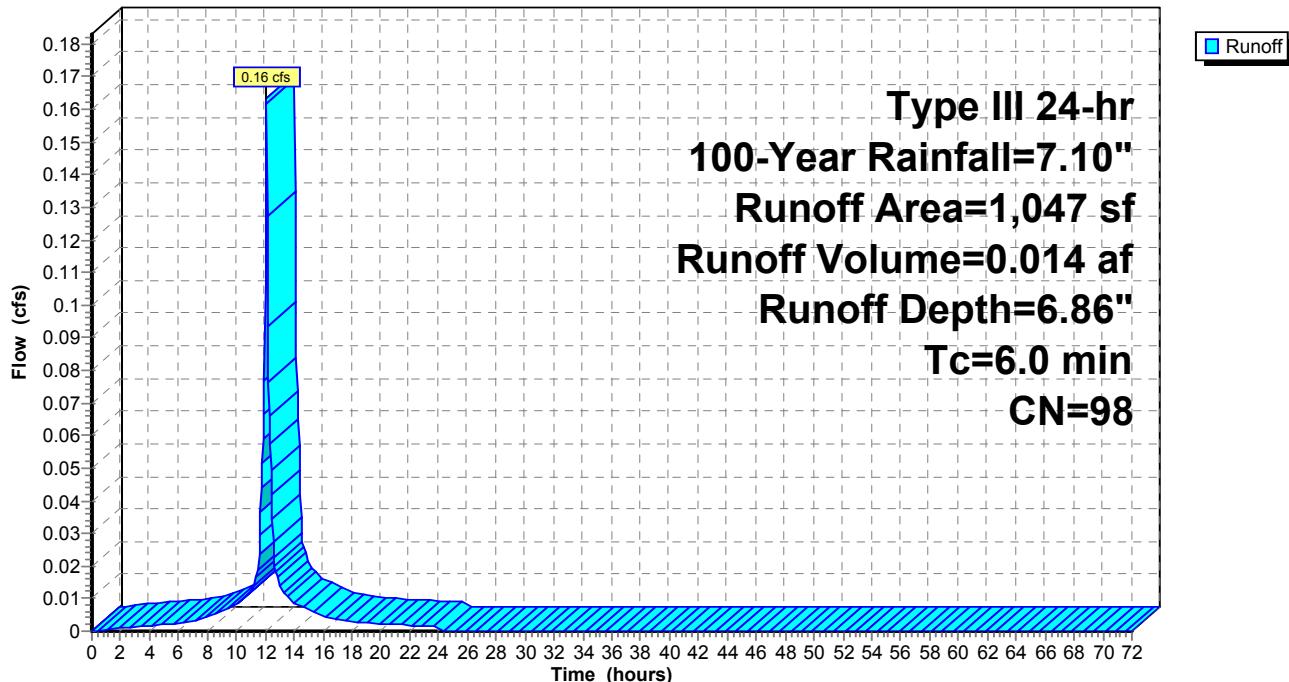
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	1,047	98	Roofs, HSG B
	1,047		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-7R: Roofs 12 F

Hydrograph



Summary for Subcatchment 3A-8R: Roofs 13 F

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 6.86"

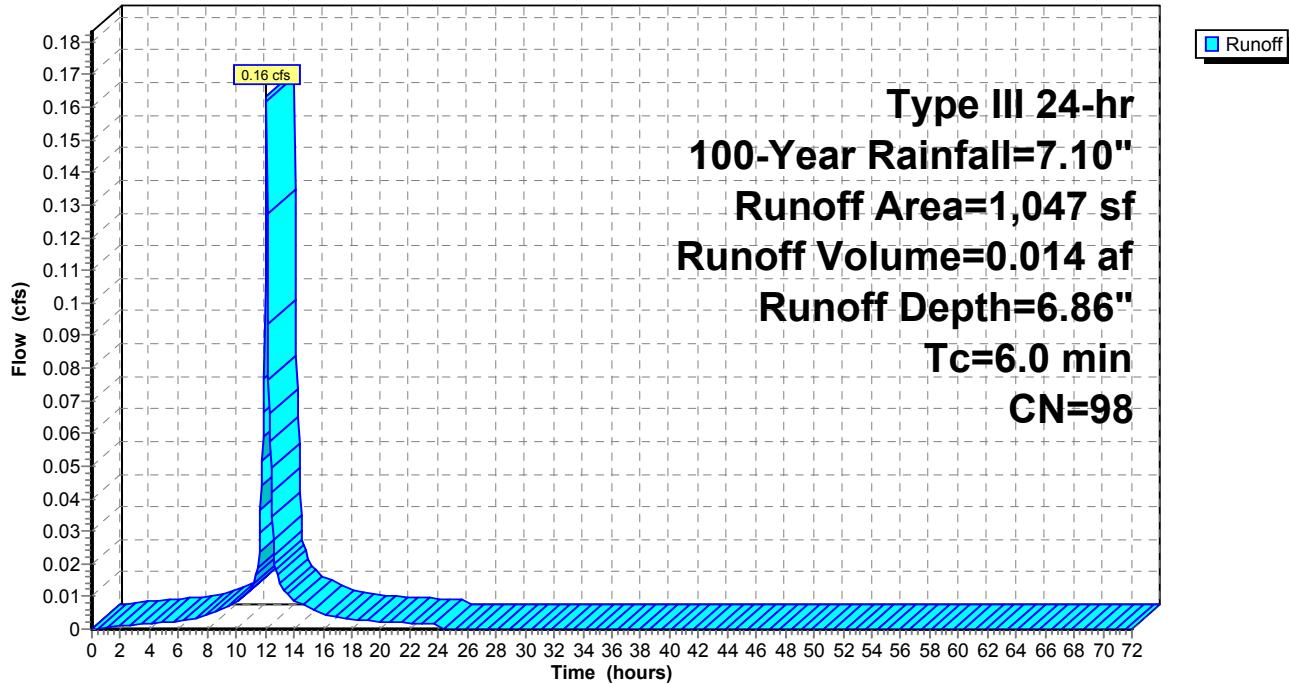
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
80	98	Roofs, HSG A
*	967	Roofs, HSG B
1,047	98	Weighted Average
1,047		100.00% Impervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 3A-8R: Roofs 13 F

Hydrograph



Summary for Subcatchment 3A-9R: Roofs 14 F

Runoff = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af, Depth= 6.86"

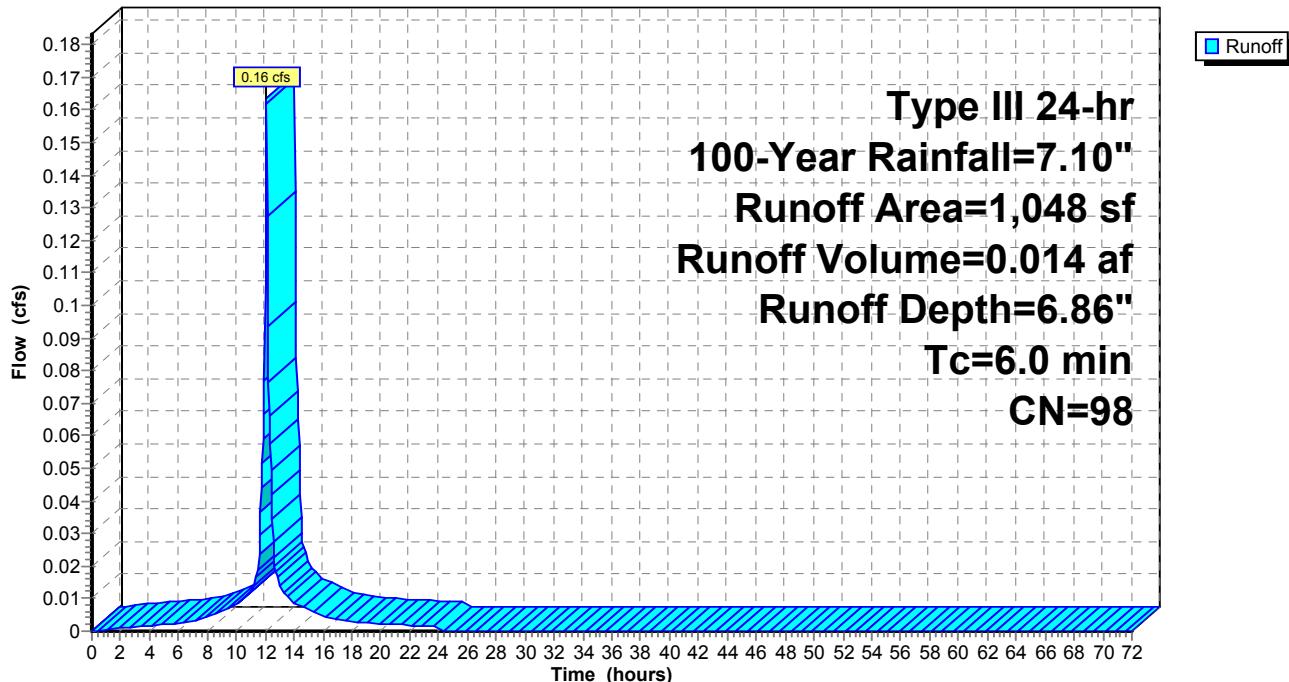
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
1,048	98	Roofs, HSG A
1,048		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 3A-9R: Roofs 14 F

Hydrograph



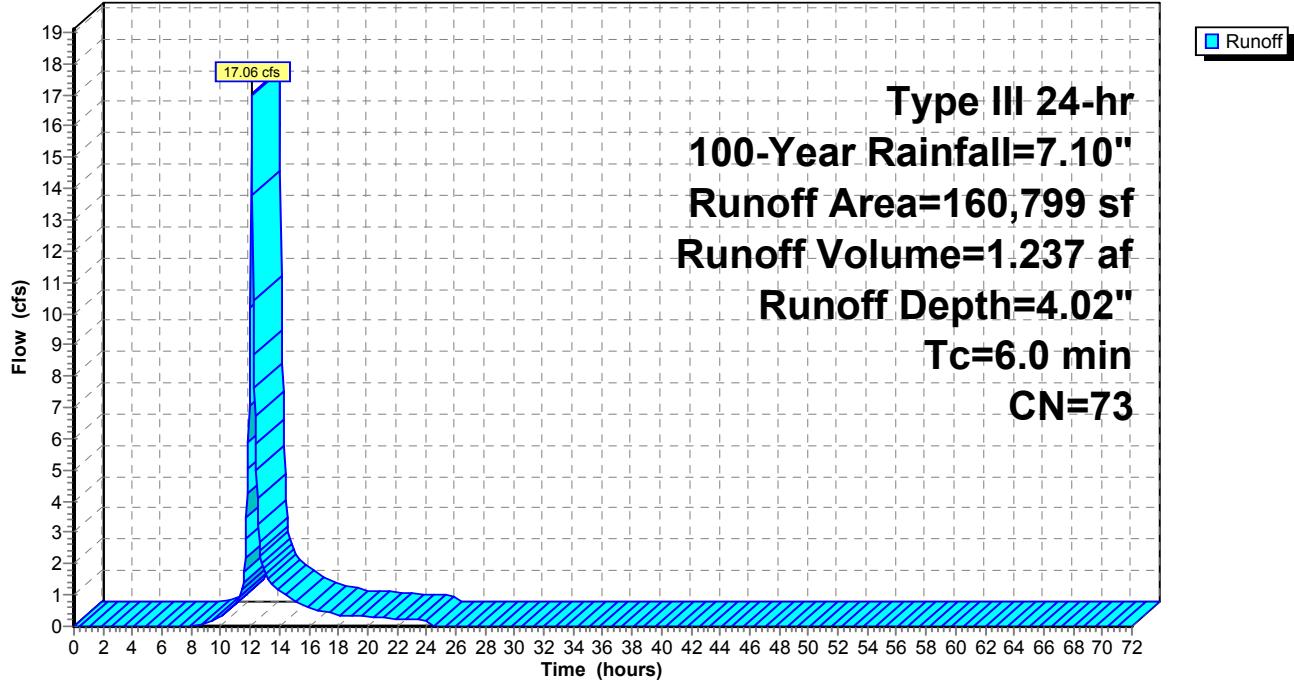
Summary for Subcatchment 3A-S: Sub-3A

Runoff = 17.06 cfs @ 12.09 hrs, Volume= 1.237 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
*	14,912	Paved drives, HSG A
*	2,050	Paved drives, HSG B
*	21,695	Paved roads w/curbs & sewers, HSG A
	8,853	Paved roads w/curbs & sewers, HSG B
*	3,012	Paved sidewalk, HSG A
*	986	Paved sidewalk. HSG B
*	1,189	Walks, HSG A
*	170	Walks, HSG B
*	922	Roofs, HSG A
*	874	Roofs, HSG B
*	2,352	Decks, HSG A
*	77	Decks, HSG B
*	7,626	Detention Basin, HSG A
*	4,140	Detention Basin, HSG B
55,493	39	>75% Grass cover, Good, HSG A
7,411	61	>75% Grass cover, Good, HSG B
2,714	98	Paved roads w/curbs & sewers, HSG A
*	474	Paved sidewalk, HSG A
*	103	Walls, HSG A
2,697	39	>75% Grass cover, Good, HSG A
*	1,384	Roofs, HSG A - offsite
16,069	98	Paved parking, HSG A - offsite
*	914	>75% Grass cover, Good, HSG A - offsite
*	1,682	Woods, Good, HSG A - offsite
*	3,000	Woods, Good, HSG A - offsite
160,799	73	Weighted Average
71,197		44.28% Pervious Area
89,602		55.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

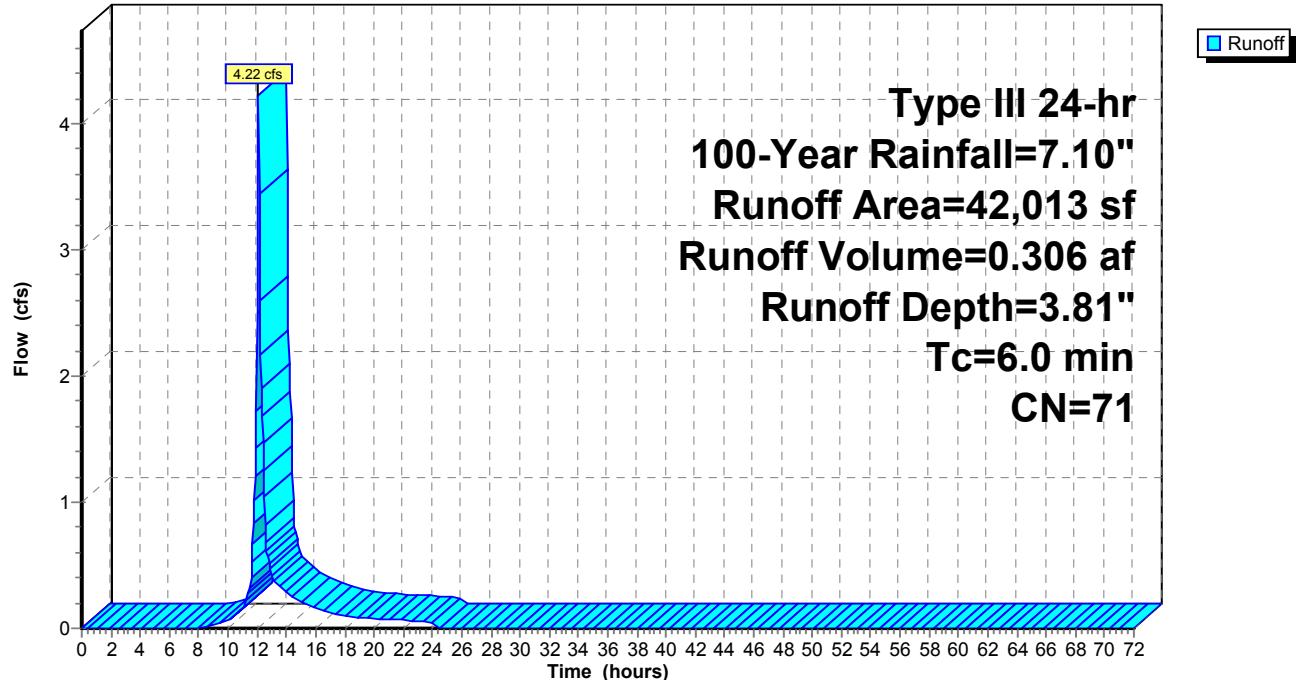
Subcatchment 3A-S: Sub-3A**Hydrograph**

Summary for Subcatchment 3B-S: Sub-3B

Runoff = 4.22 cfs @ 12.09 hrs, Volume= 0.306 af, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description		
10,864	55	Woods, Good, HSG B		
1,423	30	Woods, Good, HSG A		
*	15,816	Wetlands, HSG B		
1,532	39	>75% Grass cover, Good, HSG A		
7,195	61	>75% Grass cover, Good, HSG B		
*	0	Roofs, HSG B		
*	666	Decks, HSG B		
*	418	Wetlands, HSG B - offsite		
*	62	Woods, Good, HSG A - offsite		
*	1,346	>75% Grass cover, Good, HSG A - offsite		
*	957	>75% Grass cover, Good, HSG B - offsite		
*	1,734	Woods, Good, HSG B - offsite		
42,013	71	Weighted Average		
25,113		59.77% Pervious Area		
16,900		40.23% Impervious Area		
Tc (min)	Length (feet)	Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description		
6.0				Direct Entry,

Subcatchment 3B-S: Sub-3B**Hydrograph**

Summary for Subcatchment 3C-S: Sub-3C

Runoff = 0.93 cfs @ 12.10 hrs, Volume= 0.071 af, Depth= 2.28"

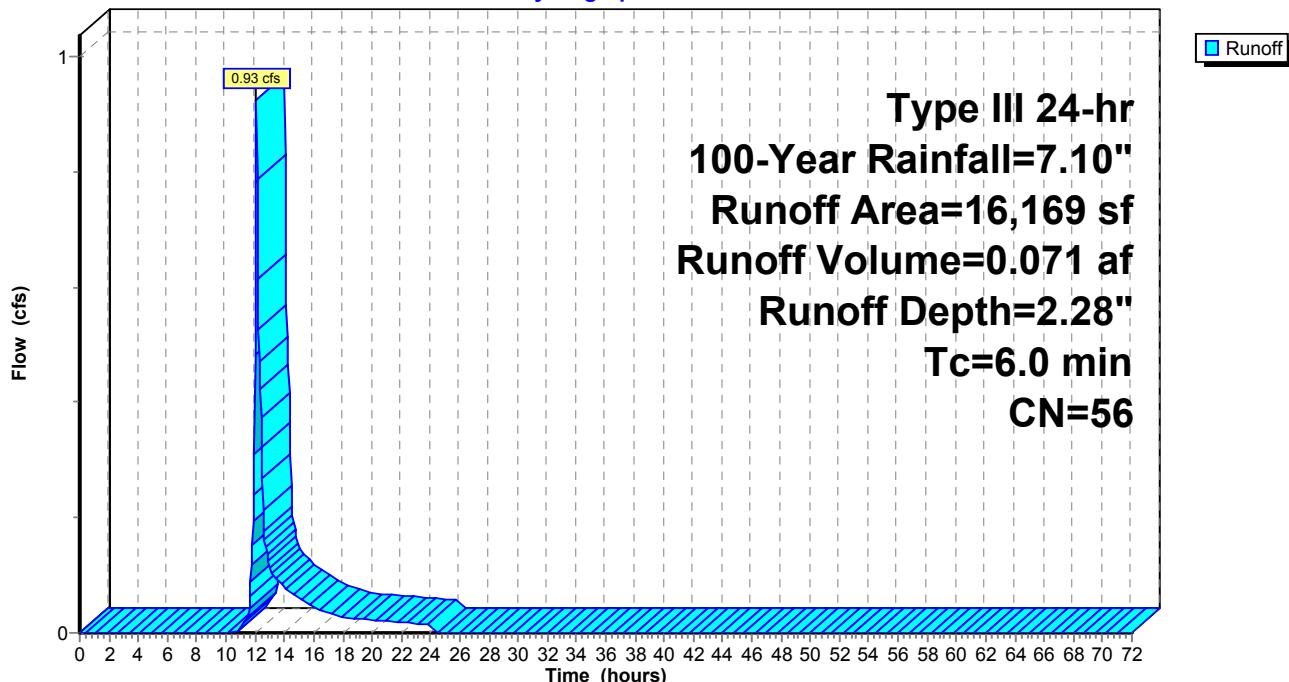
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

	Area (sf)	CN	Description
*	2,133	30	Woods, Good, HSG A - offsite
*	714	98	Paved roads w/curbs & sewers, HSG A - offsite
*	290	98	Paved drives, HSG A - offsite
*	2,061	39	>75% Grass cover, Good, HSG A - offsite
	4,666	61	>75% Grass cover, Good, HSG B
	4,041	39	>75% Grass cover, Good, HSG A
*	234	98	Paved sidewalk, HSG B
*	77	98	Paved sidewalk, HSG A
	1,600	98	Paved roads w/curbs & sewers, HSG B
*	75	98	Decks, HSG B
	278	98	Paved roads w/curbs & sewers, HSG A
	16,169	56	Weighted Average
	12,901		79.79% Pervious Area
	3,268		20.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 3C-S: Sub-3C

Hydrograph



Summary for Subcatchment 4S-1: Sub-4

Runoff = 0.84 cfs @ 12.10 hrs, Volume= 0.062 af, Depth= 2.77"

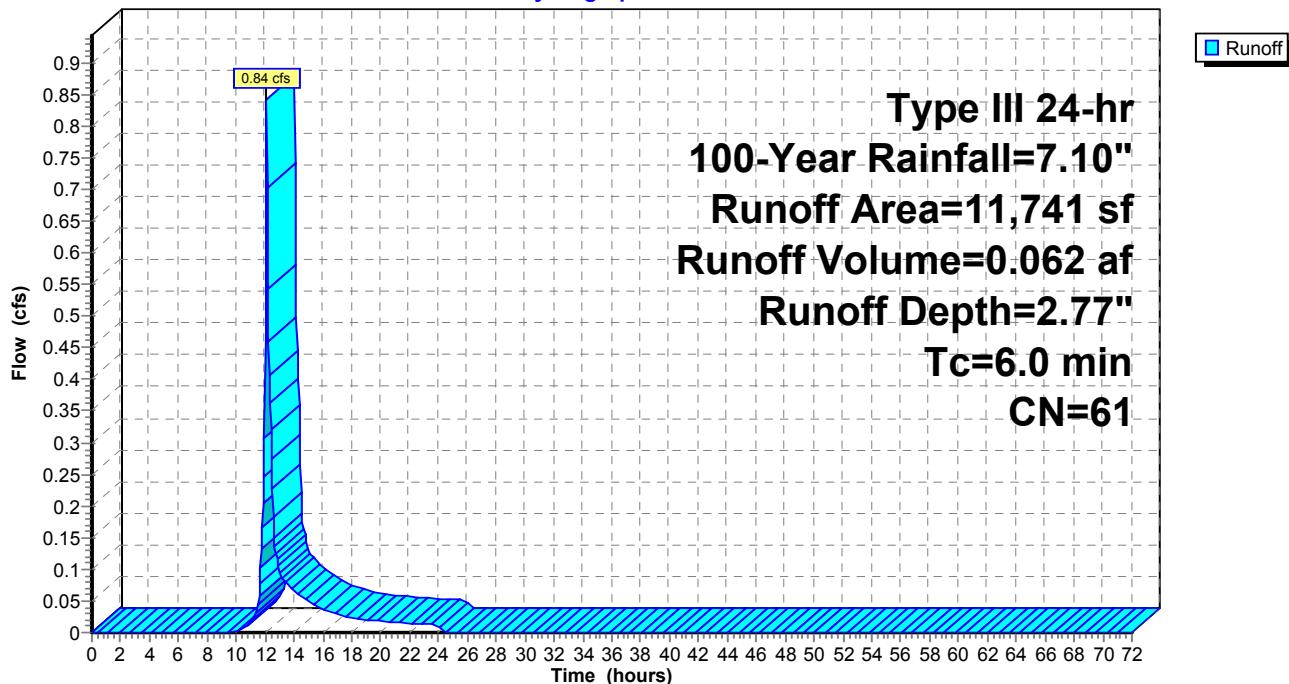
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
6,586	39	>75% Grass cover, Good, HSG A
* 942	98	Decks, HSG A
3,456	98	Roofs, HSG A
757	39	>75% Grass cover, Good, HSG A
11,741	61	Weighted Average
7,343		62.54% Pervious Area
4,398		37.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 4S-1: Sub-4

Hydrograph



Summary for Subcatchment 4S-1R: Roofs 22-24 B

Runoff = 0.41 cfs @ 12.09 hrs, Volume= 0.034 af, Depth= 6.86"

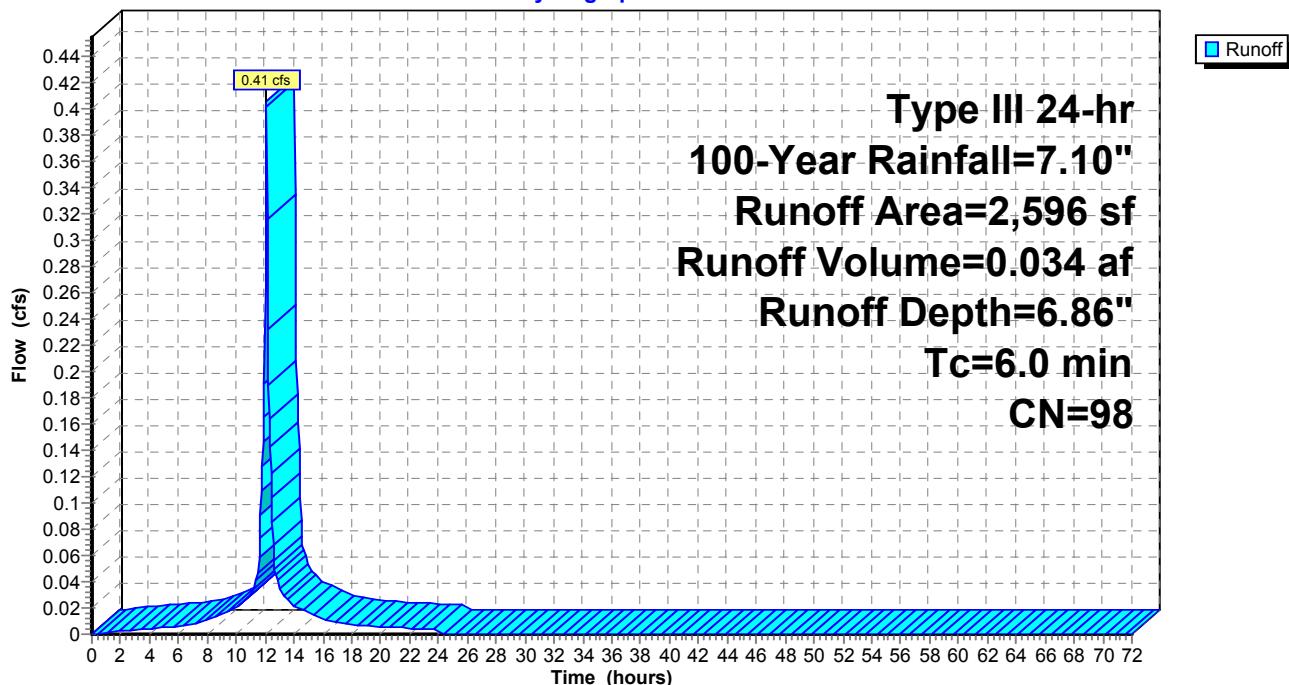
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
2,596	98	Roofs, HSG A
2,596		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 4S-1R: Roofs 22-24 B

Hydrograph



Summary for Subcatchment 4S-2: Sub-4

Runoff = 0.08 cfs @ 12.12 hrs, Volume= 0.008 af, Depth= 1.20"

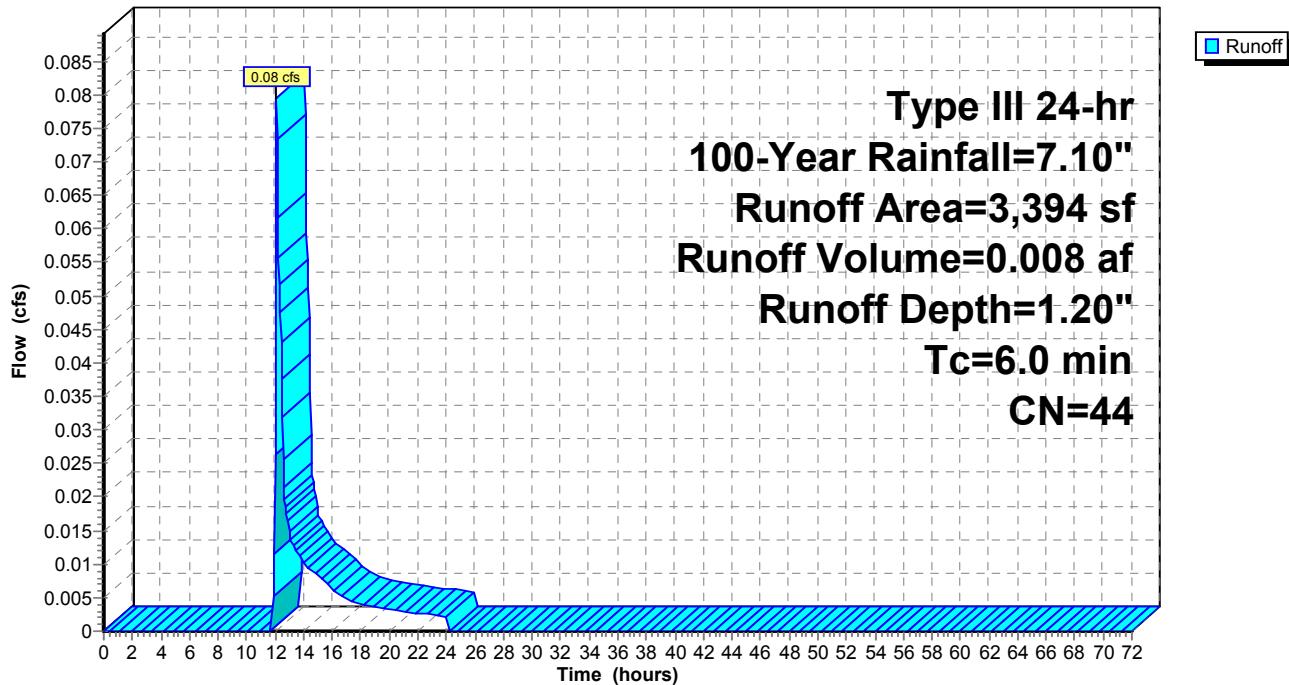
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
3,083	39	>75% Grass cover, Good, HSG A
*	185	Decks, HSG A
*	126	Walls, HSG A
3,394	44	Weighted Average
3,083		90.84% Pervious Area
311		9.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 4S-2: Sub-4

Hydrograph



Summary for Subcatchment 5S: Sub -5

Runoff = 0.35 cfs @ 12.11 hrs, Volume= 0.033 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.10"

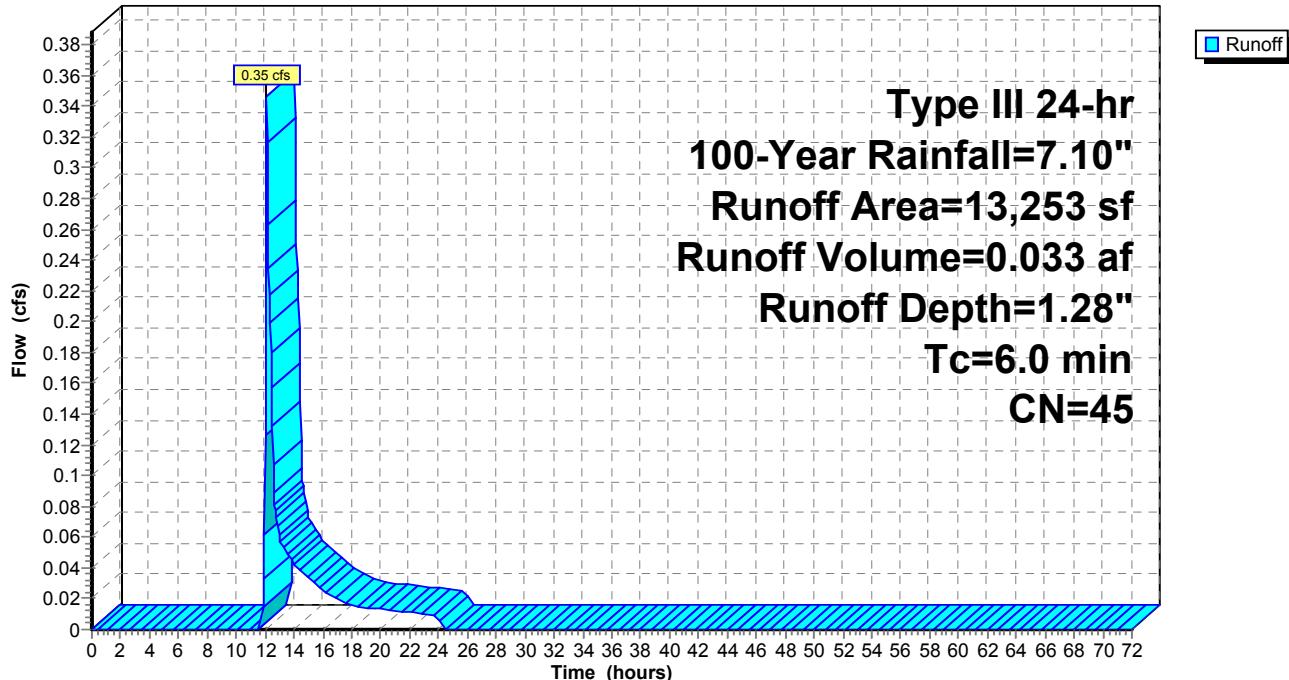
Area (sf)	CN	Description
11,396	39	>75% Grass cover, Good, HSG A
*	634	>75% Grass cover, Good, HSG D
*	14	Decks, HSG D
*	1,112	Decks, HSG A
*	40	Walls, HSG D
*	57	Walls, HSG A

13,253	45	Weighted Average
12,030		90.77% Pervious Area
1,223		9.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	Direct Entry,				

Subcatchment 5S: Sub -5

Hydrograph



Summary for Subcatchment 5S-1R: Roofs 18-21 B

Runoff = 0.53 cfs @ 12.09 hrs, Volume= 0.045 af, Depth= 6.86"

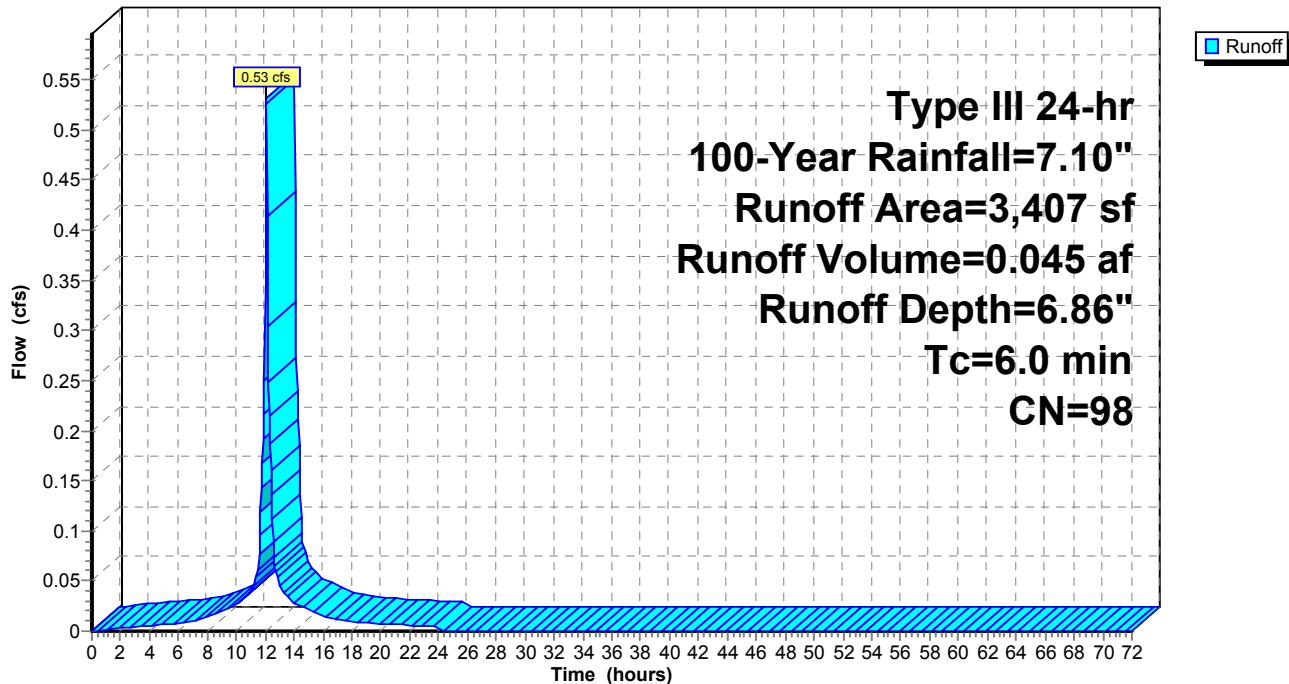
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=7.10"

Area (sf)	CN	Description
3,407	98	Roofs, HSG A
3,407		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
6.0	Direct Entry,				

Subcatchment 5S-1R: Roofs 18-21 B

Hydrograph



Summary for Reach DP-1: DMH

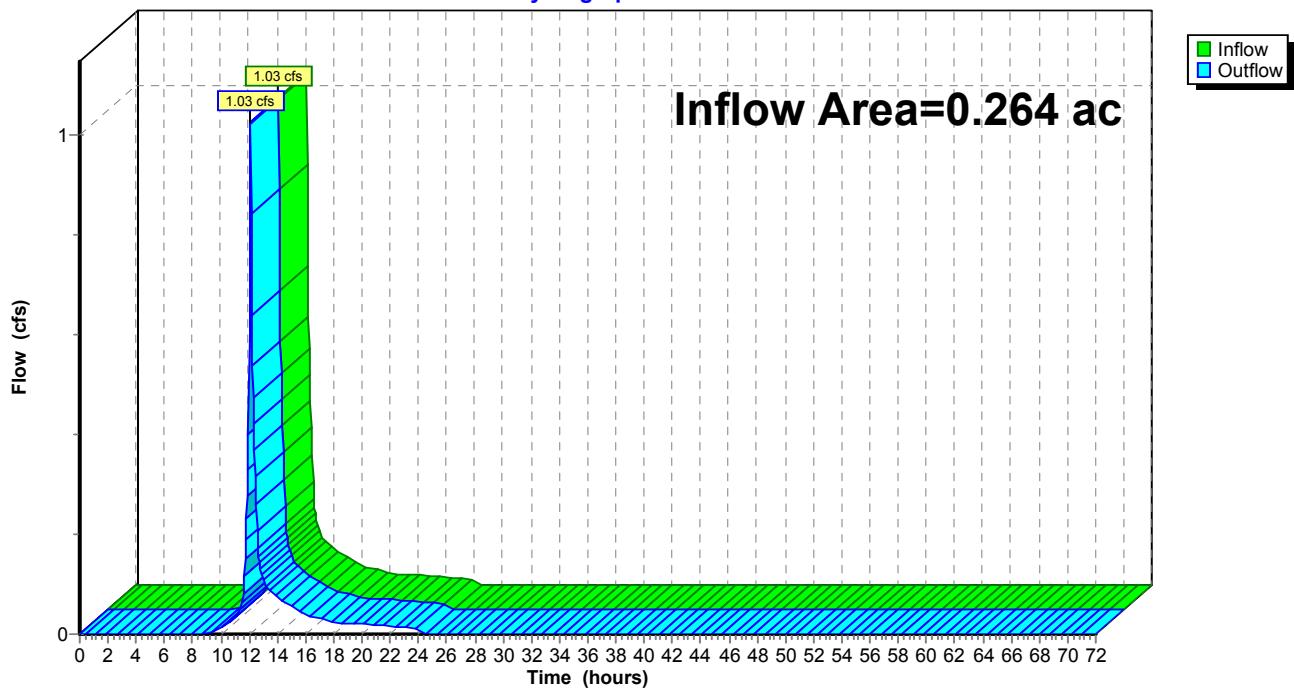
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.264 ac, 47.75% Impervious, Inflow Depth = 3.39" for 100-Year event
 Inflow = 1.03 cfs @ 12.09 hrs, Volume= 0.075 af
 Outflow = 1.03 cfs @ 12.09 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-1: DMH

Hydrograph



Summary for Reach DP-2: DP-2

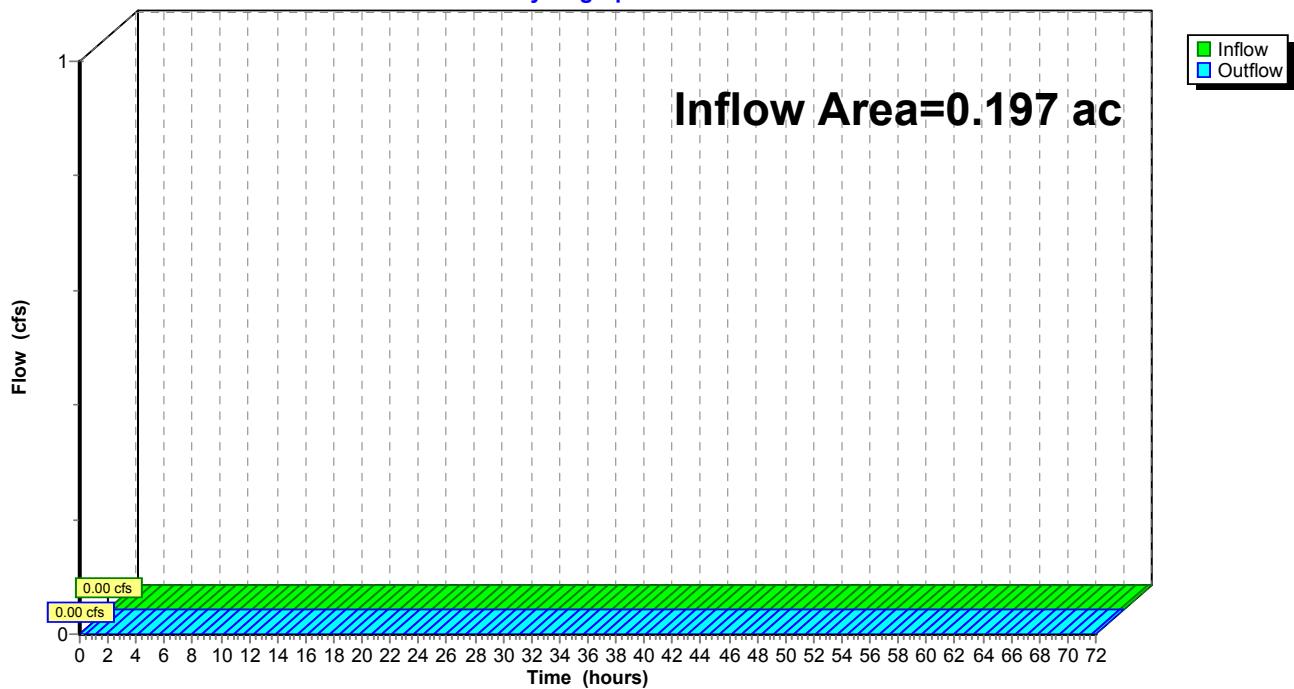
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.197 ac, 7.82% Impervious, Inflow Depth = 0.00" for 100-Year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-2: DP-2

Hydrograph



Summary for Reach DP-3: DP-3

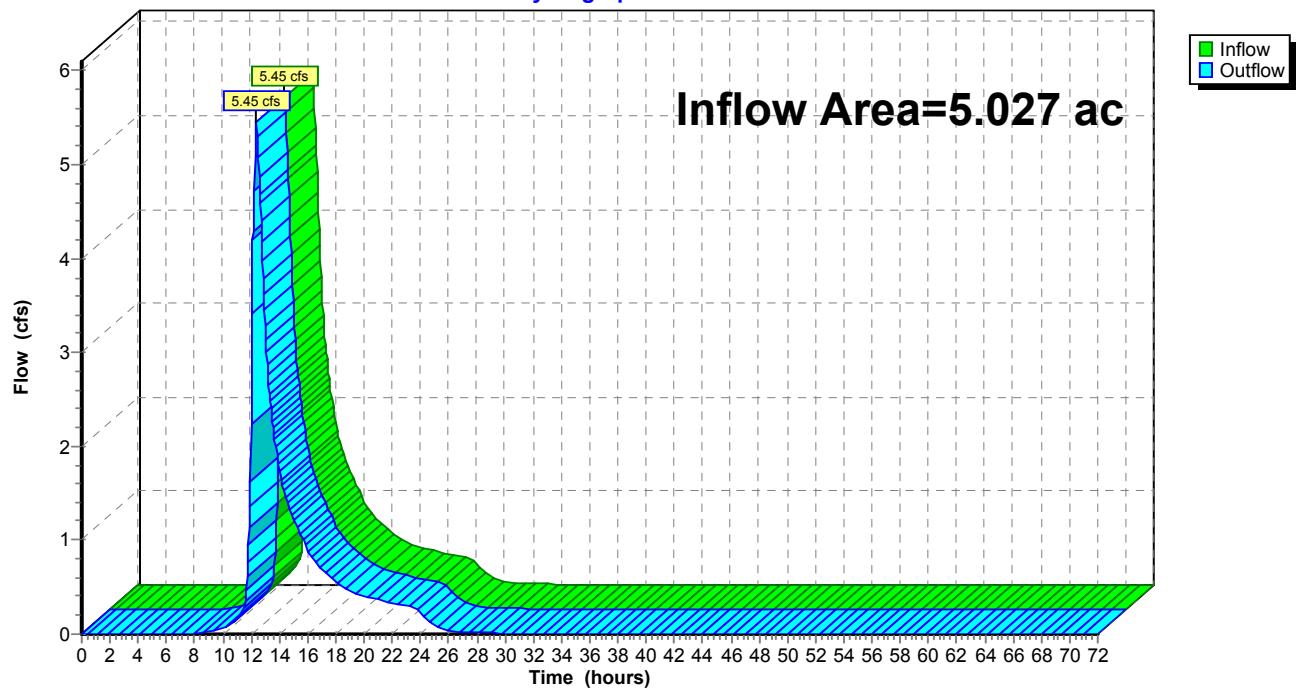
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.027 ac, 50.13% Impervious, Inflow Depth = 2.75" for 100-Year event
 Inflow = 5.45 cfs @ 12.39 hrs, Volume= 1.150 af
 Outflow = 5.45 cfs @ 12.39 hrs, Volume= 1.150 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-3: DP-3

Hydrograph



Summary for Reach DP-4: PL

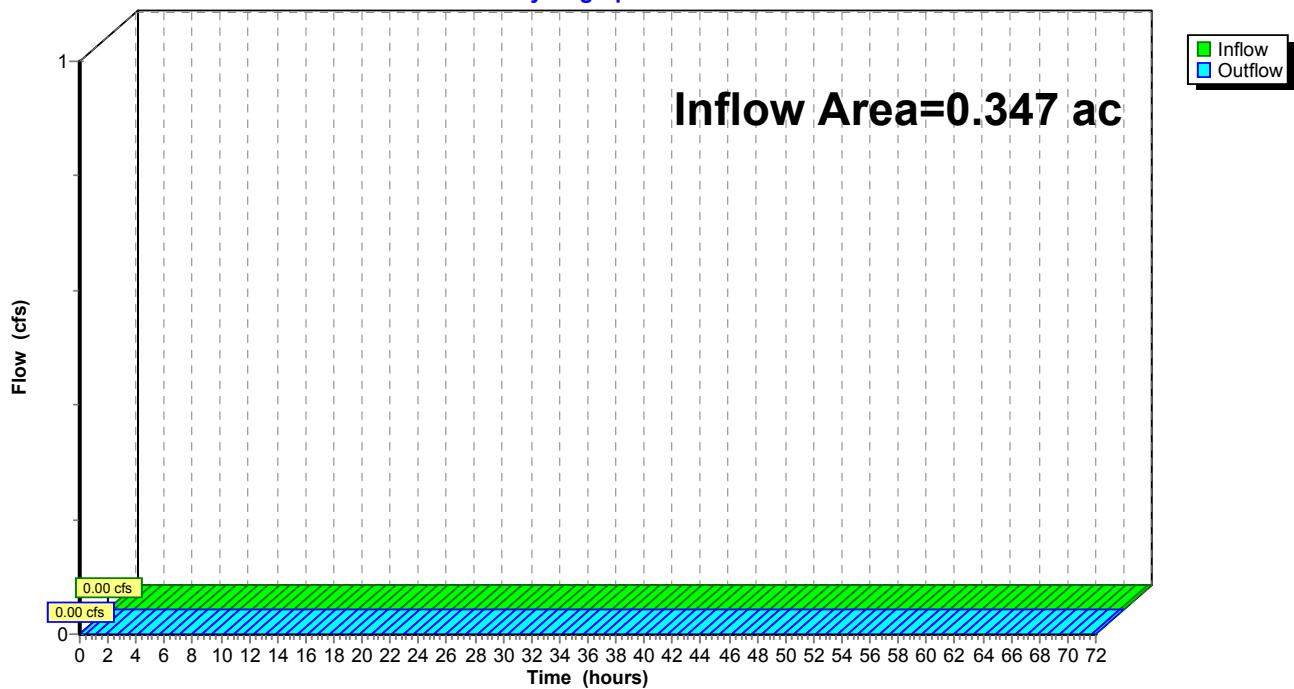
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.347 ac, 31.11% Impervious, Inflow Depth = 0.00" for 100-Year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-4: PL

Hydrograph



Summary for Reach DP-5: PL

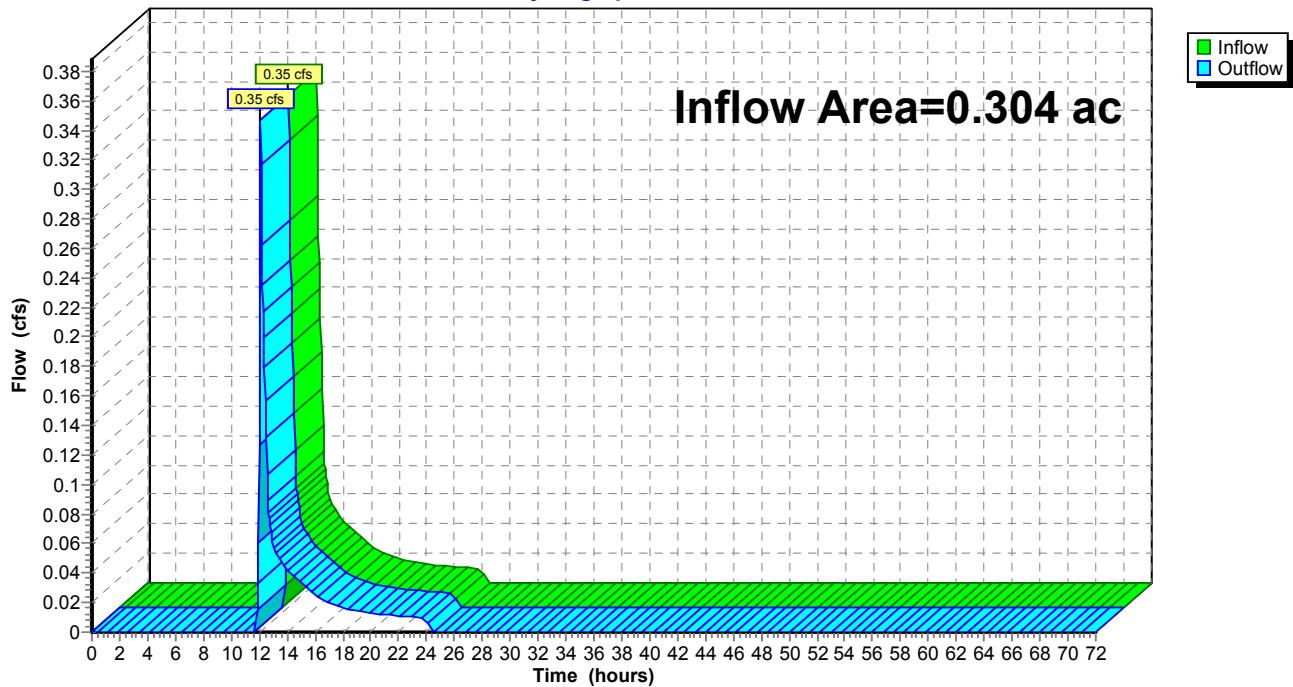
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.304 ac, 9.23% Impervious, Inflow Depth = 1.28" for 100-Year event
 Inflow = 0.35 cfs @ 12.11 hrs, Volume= 0.033 af
 Outflow = 0.35 cfs @ 12.11 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2

Reach DP-5: PL

Hydrograph



Summary for Pond D-1: Depression

Inflow Area = 0.197 ac, 7.82% Impervious, Inflow Depth = 1.20" for 100-Year event
 Inflow = 0.20 cfs @ 12.12 hrs, Volume= 0.020 af
 Outflow = 0.09 cfs @ 12.45 hrs, Volume= 0.020 af, Atten= 53%, Lag= 20.1 min
 Discarded = 0.09 cfs @ 12.45 hrs, Volume= 0.020 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

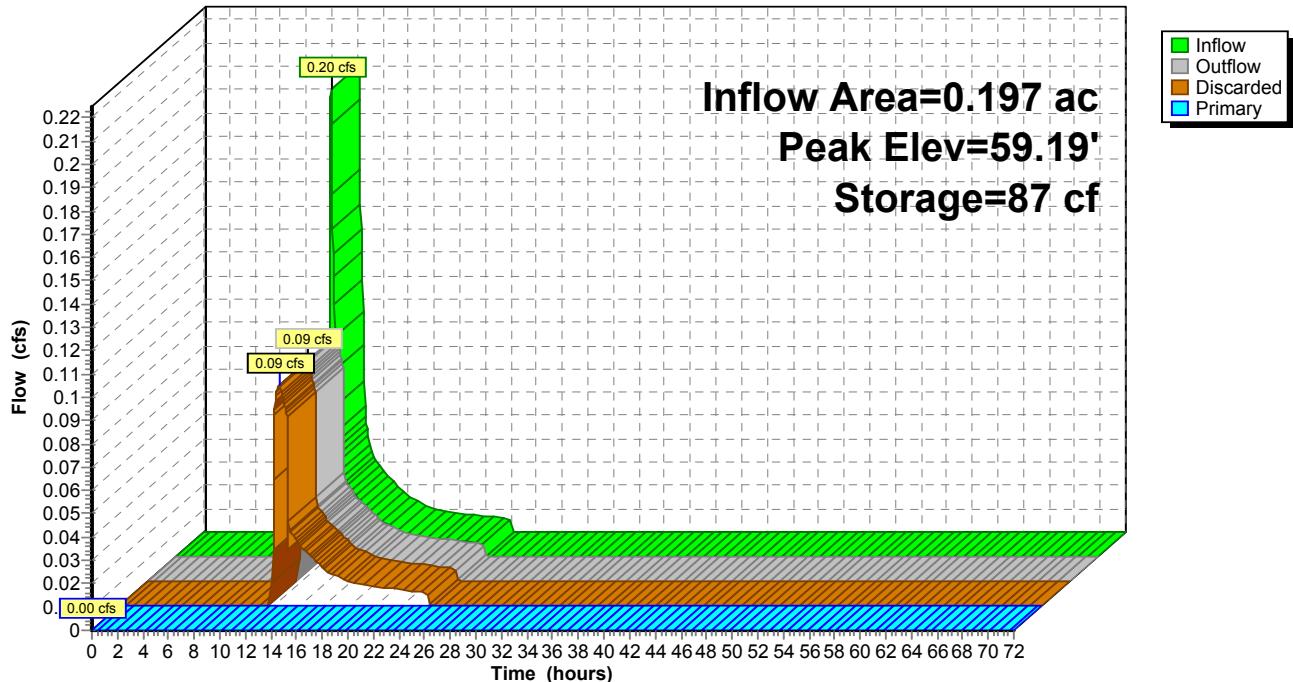
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.19' @ 12.45 hrs Surf.Area= 494 sf Storage= 87 cf

Plug-Flow detention time= 4.4 min calculated for 0.020 af (100% of inflow)
 Center-of-Mass det. time= 4.4 min (906.3 - 901.9)

Volume	Invert	Avail.Storage	Storage Description	
#1	59.00'	615 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
59.00	419	0	0	
60.00	811	615	615	
Device	Routing	Invert	Outlet Devices	
#1	Discarded	59.00'	8.270 in/hr Exfiltration over Surface area	Phase-In= 0.01'
#2	Primary	60.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir	
			Head (feet)	0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
				2.50 3.00 3.50 4.00 4.50
			Coef. (English)	2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
				2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.09 cfs @ 12.45 hrs HW=59.19' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' TW=0.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond D-1: Depression**Hydrograph**

Summary for Pond D-2: Depression

Inflow Area = 0.371 ac, 20.21% Impervious, Inflow Depth = 2.28" for 100-Year event
 Inflow = 0.93 cfs @ 12.10 hrs, Volume= 0.071 af
 Outflow = 0.20 cfs @ 12.57 hrs, Volume= 0.071 af, Atten= 79%, Lag= 28.3 min
 Discarded = 0.20 cfs @ 12.57 hrs, Volume= 0.071 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

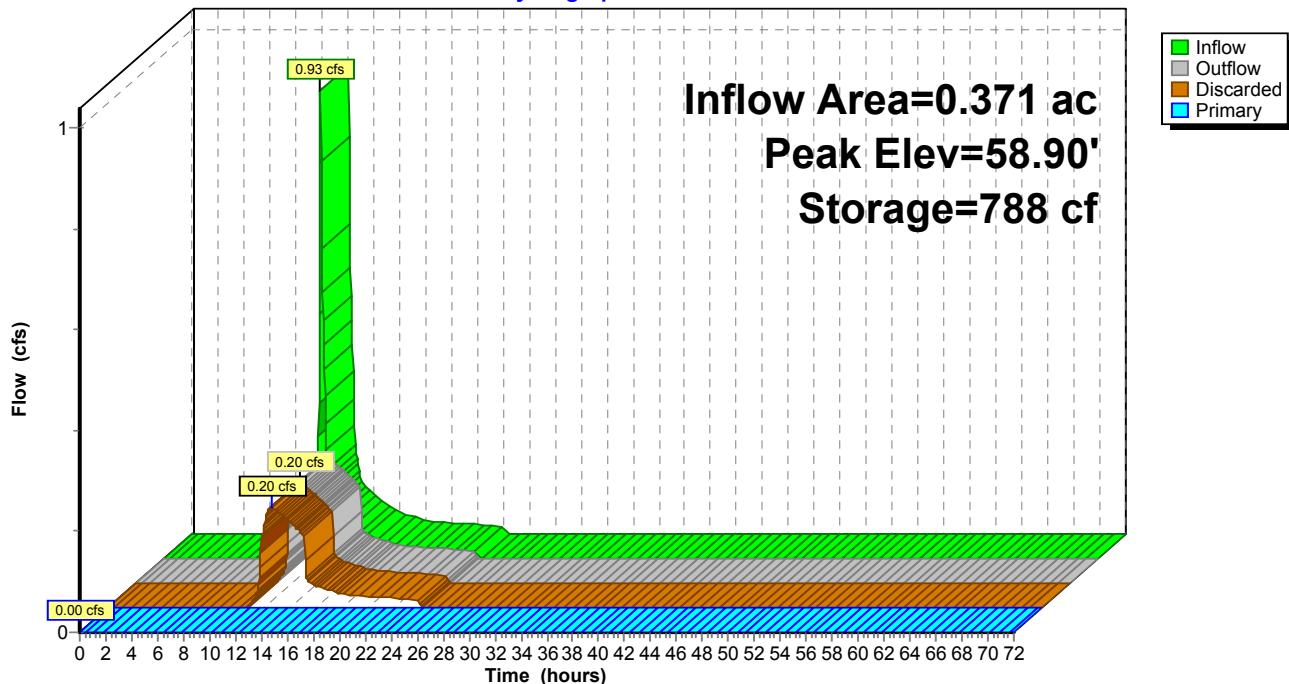
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 58.90' @ 12.57 hrs Surf.Area= 1,035 sf Storage= 788 cf

Plug-Flow detention time= 28.4 min calculated for 0.071 af (100% of inflow)
 Center-of-Mass det. time= 28.4 min (890.9 - 862.6)

Volume	Invert	Avail.Storage	Storage Description	
#1	58.00'	899 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
58.00	726	0	0	
59.00	1,071	899	899	
Device	Routing	Invert	Outlet Devices	
#1	Discarded	58.00'	8.270 in/hr Exfiltration over Surface area	Phase-In= 0.01'
#2	Primary	59.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir	
			Head (feet)	0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
				2.50 3.00 3.50 4.00 4.50
			Coef. (English)	2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
				2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.20 cfs @ 12.57 hrs HW=58.89' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' TW=56.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond D-2: Depression**Hydrograph**

Summary for Pond D-3: Depression

Inflow Area = 0.270 ac, 37.46% Impervious, Inflow Depth = 2.77" for 100-Year event
 Inflow = 0.84 cfs @ 12.10 hrs, Volume= 0.062 af
 Outflow = 0.03 cfs @ 11.65 hrs, Volume= 0.062 af, Atten= 96%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.65 hrs, Volume= 0.062 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 64.36' @ 16.80 hrs Surf.Area= 1,593 sf Storage= 1,590 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 552.3 min (1,402.6 - 850.4)

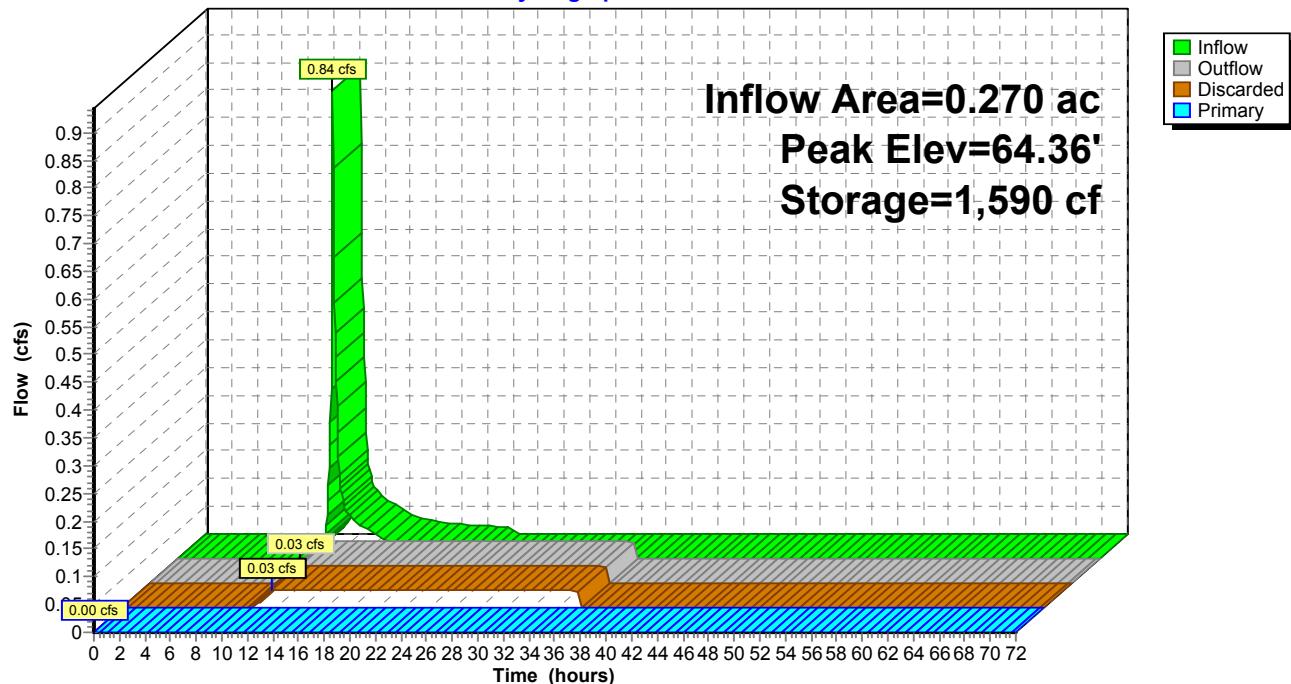
Volume	Invert	Avail.Storage	Storage Description	
#1	63.00'	2,747 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
63.00	757	0	0
64.00	1,368	1,063	1,063
65.00	2,001	1,685	2,747

Device	Routing	Invert	Outlet Devices	
#1	Discarded	63.00'	0.03 cfs Exfiltration when above 63.00'	
#2	Primary	65.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32	

Discarded OutFlow Max=0.03 cfs @ 11.65 hrs HW=63.02' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=63.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond D-3: Depression**Hydrograph**

Summary for Pond D-4: Depression

Inflow Area = 0.078 ac, 9.16% Impervious, Inflow Depth = 1.20" for 100-Year event
 Inflow = 0.08 cfs @ 12.12 hrs, Volume= 0.008 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.45' @ 24.40 hrs Surf.Area= 903 sf Storage= 339 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

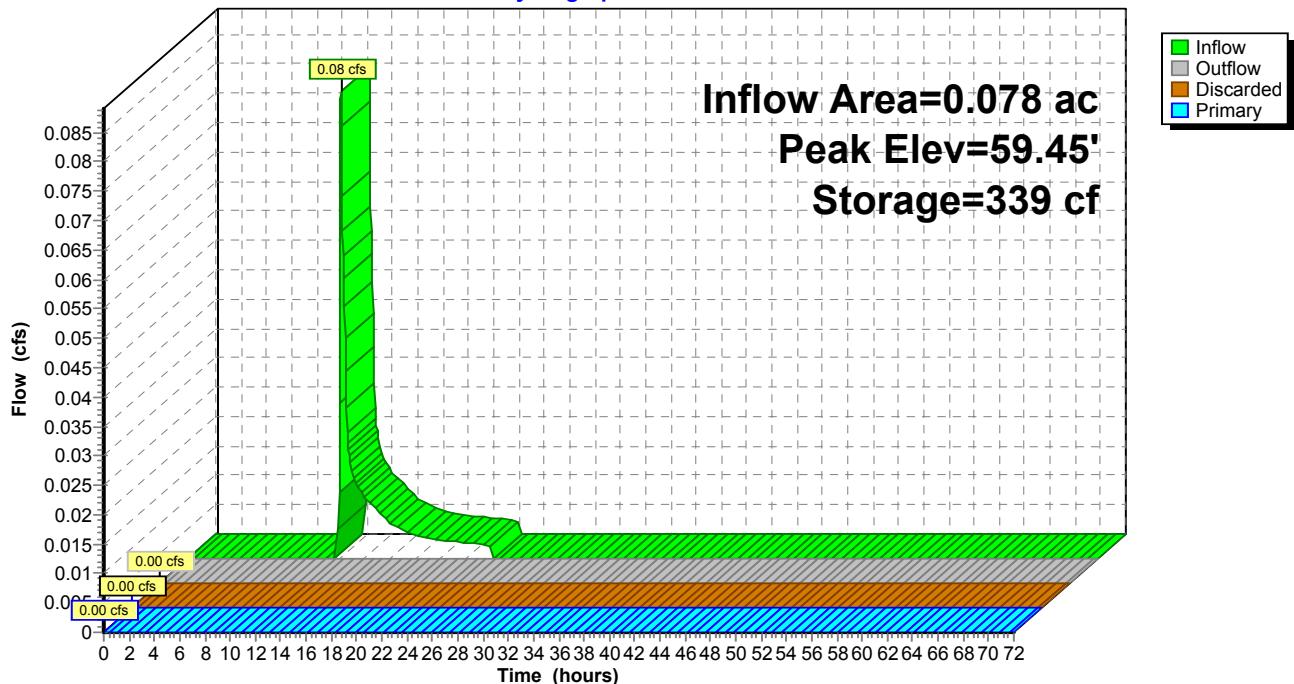
Volume	Invert	Avail.Storage	Storage Description	
#1	59.00'	938 cf	Custom Stage Data (Prismatic)	Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	622	0	0
60.00	1,254	938	938

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	0.03 cfs Exfiltration when above 63.00'
#2	Primary	65.00'	24.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' (Free Discharge)
 ↑ 1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.00' TW=0.00' (Dynamic Tailwater)
 ↑ 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond D-4: Depression**Hydrograph**

Summary for Pond DB-1: Prop Detention Basin

Inflow Area = 3.691 ac, 55.72% Impervious, Inflow Depth = 4.02" for 100-Year event
 Inflow = 17.06 cfs @ 12.09 hrs, Volume= 1.237 af
 Outflow = 4.00 cfs @ 12.51 hrs, Volume= 0.844 af, Atten= 77%, Lag= 24.9 min
 Primary = 4.00 cfs @ 12.51 hrs, Volume= 0.844 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 60.97' @ 12.51 hrs Surf.Area= 11,231 sf Storage= 25,214 cf

Plug-Flow detention time= 209.2 min calculated for 0.844 af (68% of inflow)
 Center-of-Mass det. time= 110.3 min (933.8 - 823.6)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	25,568 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	5,474	0	0
59.00	7,714	6,594	6,594
60.00	9,473	8,594	15,188
61.00	11,288	10,381	25,568

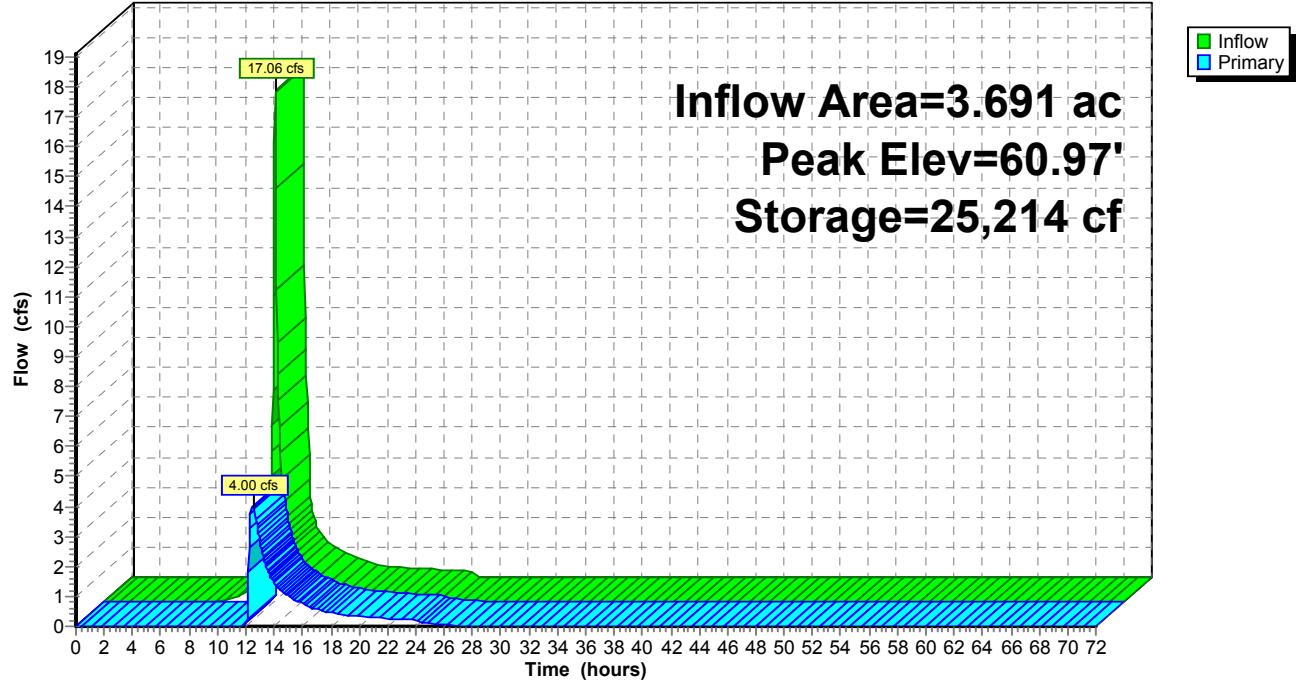
Device	Routing	Invert	Outlet Devices
#1	Primary	58.20'	10.0" Round Culvert L= 25.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 58.20' / 58.05' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 0.55 sf
#2	Device 1	60.20'	2.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.6' Crest Height
#3	Device 1	61.50'	7.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s) 2.4' Crest Height

Primary OutFlow Max=4.00 cfs @ 12.51 hrs HW=60.97' TW=56.07' (Dynamic Tailwater)

↑ 1=Culvert (Barrel Controls 4.00 cfs @ 7.33 fps)

 └ 2=Sharp-Crested Rectangular Weir(Passes 4.00 cfs of 4.30 cfs potential flow)

 └ 3=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond DB-1: Prop Detention Basin**Hydrograph**

Summary for Pond P1: Infiltration Chambers

Inflow Area = 0.044 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.025 af
 Outflow = 0.04 cfs @ 11.65 hrs, Volume= 0.025 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.65 hrs, Volume= 0.025 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 58.67' @ 12.64 hrs Surf.Area= 199 sf Storage= 318 cf

Plug-Flow detention time= 49.5 min calculated for 0.025 af (100% of inflow)
 Center-of-Mass det. time= 49.5 min (792.2 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	195 cf	6.33'W x 31.50'L x 3.54'H Field A 707 cf Overall - 220 cf Embedded = 487 cf x 40.0% Voids
#2A	56.70'	220 cf	Cultec R-330XLHD x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.200 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.65 hrs HW=56.25' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P1: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

4 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 29.50' Row Length +12.0" End Stone x 2 = 31.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

4 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 219.8 cf Chamber Storage

706.6 cf Field - 219.8 cf Chambers = 486.8 cf Stone x 40.0% Voids = 194.7 cf Stone Storage

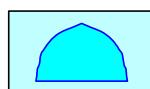
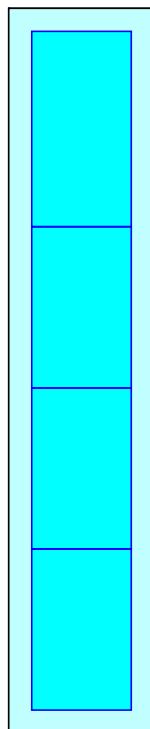
Chamber Storage + Stone Storage = 414.5 cf = 0.010 af

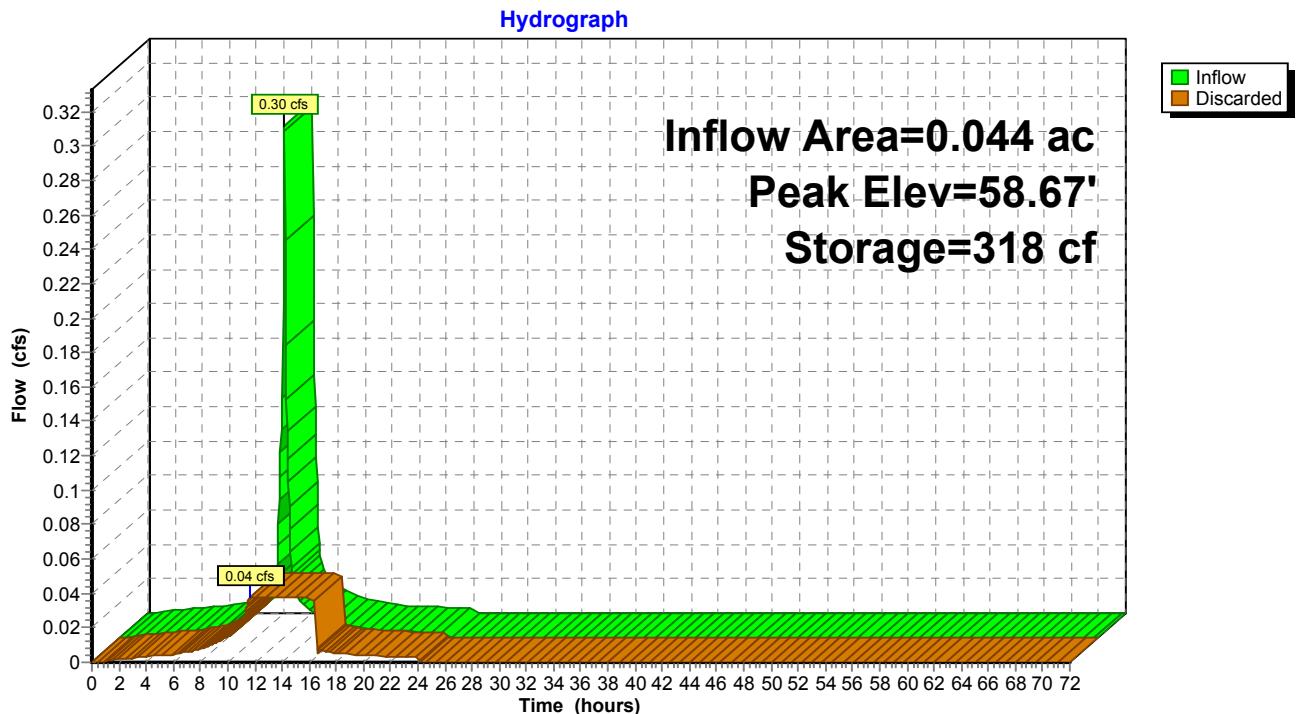
Overall Storage Efficiency = 58.7%

4 Chambers

26.2 cy Field

18.0 cy Stone



Pond P1: Infiltration Chambers

Summary for Pond P10: Infiltration Chambers

Inflow Area = 0.044 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.025 af
 Outflow = 0.04 cfs @ 11.65 hrs, Volume= 0.025 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.65 hrs, Volume= 0.025 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 62.06' @ 12.63 hrs Surf.Area= 199 sf Storage= 317 cf

Plug-Flow detention time= 48.8 min calculated for 0.025 af (100% of inflow)
 Center-of-Mass det. time= 48.7 min (791.5 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	195 cf	6.33'W x 31.50'L x 3.54'H Field A 707 cf Overall - 220 cf Embedded = 487 cf x 40.0% Voids
#2A	60.10'	220 cf	Cultec R-330XLHD x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
415 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.65 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P10: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

4 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 29.50' Row Length +12.0" End Stone x 2 = 31.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

4 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 219.8 cf Chamber Storage

706.6 cf Field - 219.8 cf Chambers = 486.8 cf Stone x 40.0% Voids = 194.7 cf Stone Storage

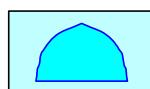
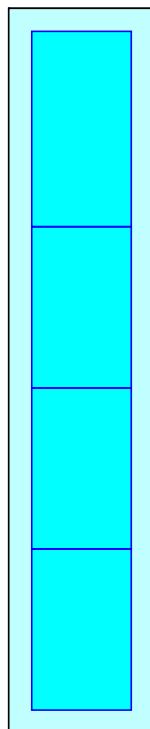
Chamber Storage + Stone Storage = 414.5 cf = 0.010 af

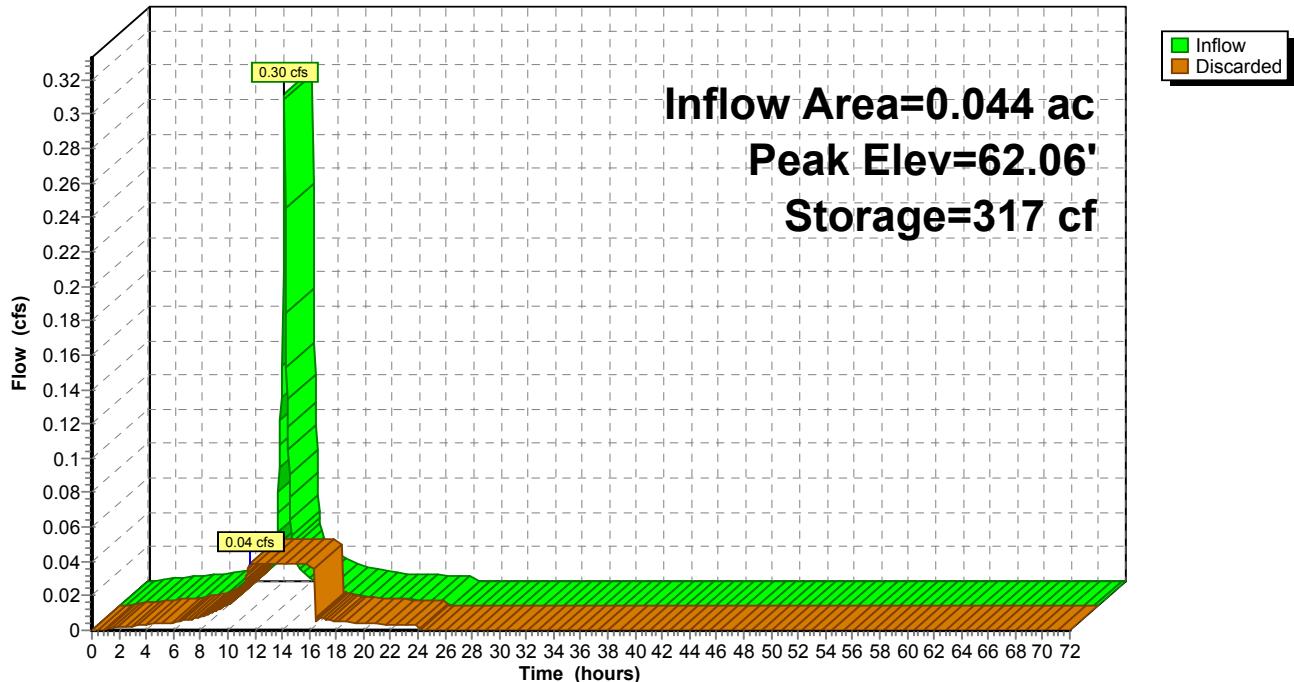
Overall Storage Efficiency = 58.7%

4 Chambers

26.2 cy Field

18.0 cy Stone



Pond P10: Infiltration Chambers**Hydrograph**

Summary for Pond P11: Infiltration Chambers

Inflow Area = 0.087 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.59 cfs @ 12.09 hrs, Volume= 0.050 af
 Outflow = 0.06 cfs @ 11.60 hrs, Volume= 0.050 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 11.60 hrs, Volume= 0.050 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 66.46' @ 12.78 hrs Surf.Area= 332 sf Storage= 686 cf

Plug-Flow detention time= 68.2 min calculated for 0.050 af (100% of inflow)
 Center-of-Mass det. time= 68.2 min (810.9 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	63.00'	321 cf	6.33'W x 52.50'L x 3.54'H Field A 1,178 cf Overall - 376 cf Embedded = 801 cf x 40.0% Voids
#2A	63.50'	376 cf	Cultec R-330XLHD x 7 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
697 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	63.00'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.06 cfs @ 11.60 hrs HW=63.06' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.06 cfs)

Pond P11: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

7 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 50.50' Row Length +12.0" End Stone x 2 = 52.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

7 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 376.3 cf Chamber Storage

1,177.6 cf Field - 376.3 cf Chambers = 801.3 cf Stone x 40.0% Voids = 320.5 cf Stone Storage

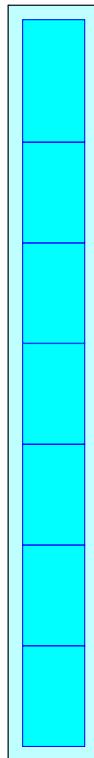
Chamber Storage + Stone Storage = 696.8 cf = 0.016 af

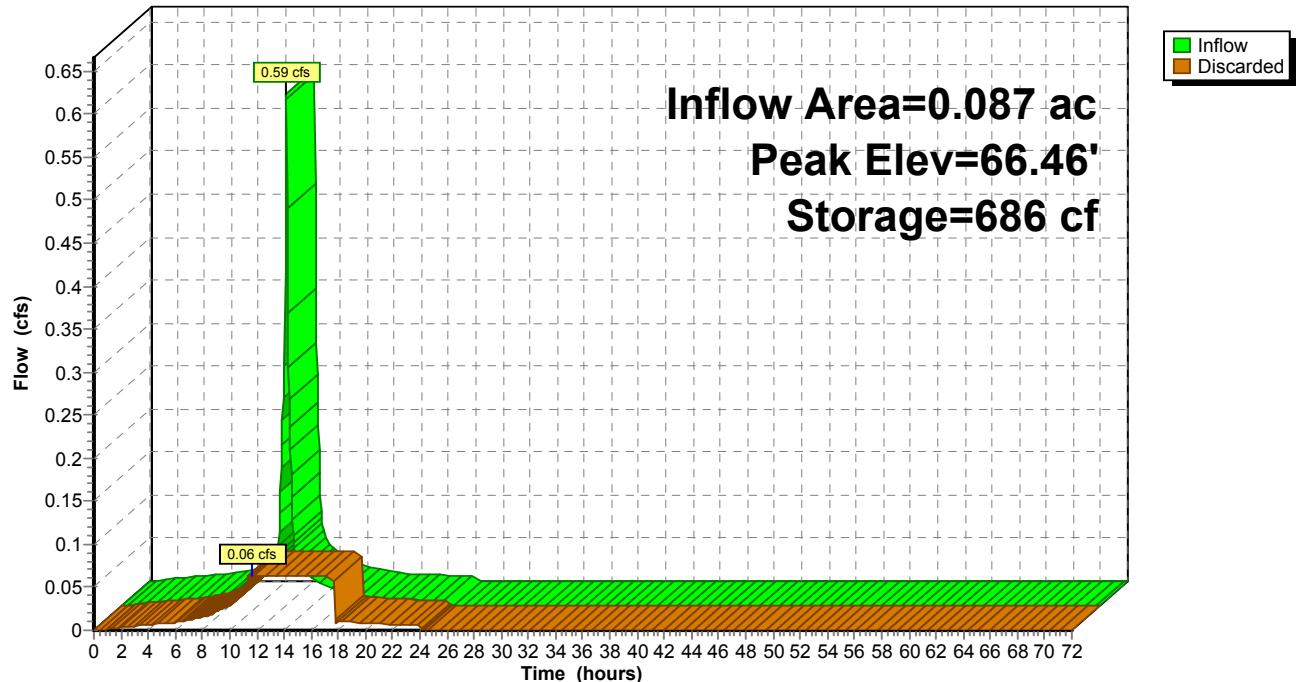
Overall Storage Efficiency = 59.2%

7 Chambers

43.6 cy Field

29.7 cy Stone



Pond P11: Infiltration Chambers**Hydrograph**

Summary for Pond P12: Infiltration Chambers

Inflow Area = 0.168 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 1.14 cfs @ 12.09 hrs, Volume= 0.096 af
 Outflow = 0.19 cfs @ 11.70 hrs, Volume= 0.096 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.19 cfs @ 11.70 hrs, Volume= 0.096 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.83' @ 12.56 hrs Surf.Area= 977 sf Storage= 1,078 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 30.6 min (773.3 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	875 cf	11.17'W x 87.50'L x 3.54'H Field A 3,461 cf Overall - 1,274 cf Embedded = 2,186 cf x 40.0% Voids
#2A	56.70'	1,274 cf	Cultec R-330XLHD x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
2,149 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.19 cfs @ 11.70 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.19 cfs)

Pond P12: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

12 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 85.50' Row Length +12.0" End Stone x 2 = 87.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

24 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,274.1 cf Chamber Storage

3,460.5 cf Field - 1,274.1 cf Chambers = 2,186.4 cf Stone x 40.0% Voids = 874.6 cf Stone Storage

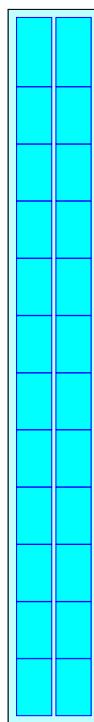
Chamber Storage + Stone Storage = 2,148.7 cf = 0.049 af

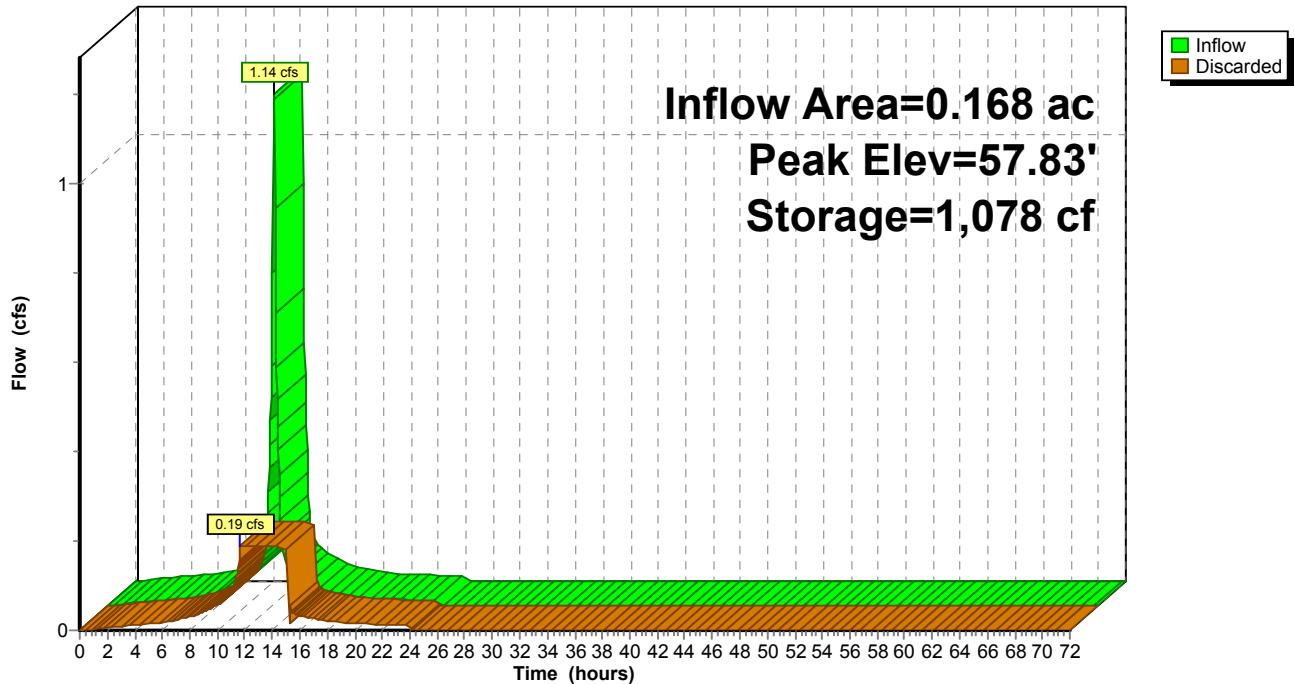
Overall Storage Efficiency = 62.1%

24 Chambers

128.2 cy Field

81.0 cy Stone



Pond P12: Infiltration Chambers**Hydrograph**

Summary for Pond P13: Infiltration Chambers

Inflow Area = 0.138 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.94 cfs @ 12.09 hrs, Volume= 0.079 af
 Outflow = 0.19 cfs @ 11.75 hrs, Volume= 0.079 af, Atten= 80%, Lag= 0.0 min
 Discarded = 0.19 cfs @ 11.75 hrs, Volume= 0.079 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 57.44' @ 12.51 hrs Surf.Area= 977 sf Storage= 778 cf

Plug-Flow detention time= 20.3 min calculated for 0.079 af (100% of inflow)
 Center-of-Mass det. time= 20.3 min (763.1 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	875 cf	11.17'W x 87.50'L x 3.54'H Field A 3,461 cf Overall - 1,274 cf Embedded = 2,186 cf x 40.0% Voids
#2A	56.70'	1,274 cf	Cultec R-330XLHD x 24 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
2,149 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.19 cfs @ 11.75 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.19 cfs)

Pond P13: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

12 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 85.50' Row Length +12.0" End Stone x 2 = 87.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

24 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,274.1 cf Chamber Storage

3,460.5 cf Field - 1,274.1 cf Chambers = 2,186.4 cf Stone x 40.0% Voids = 874.6 cf Stone Storage

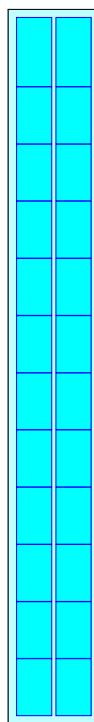
Chamber Storage + Stone Storage = 2,148.7 cf = 0.049 af

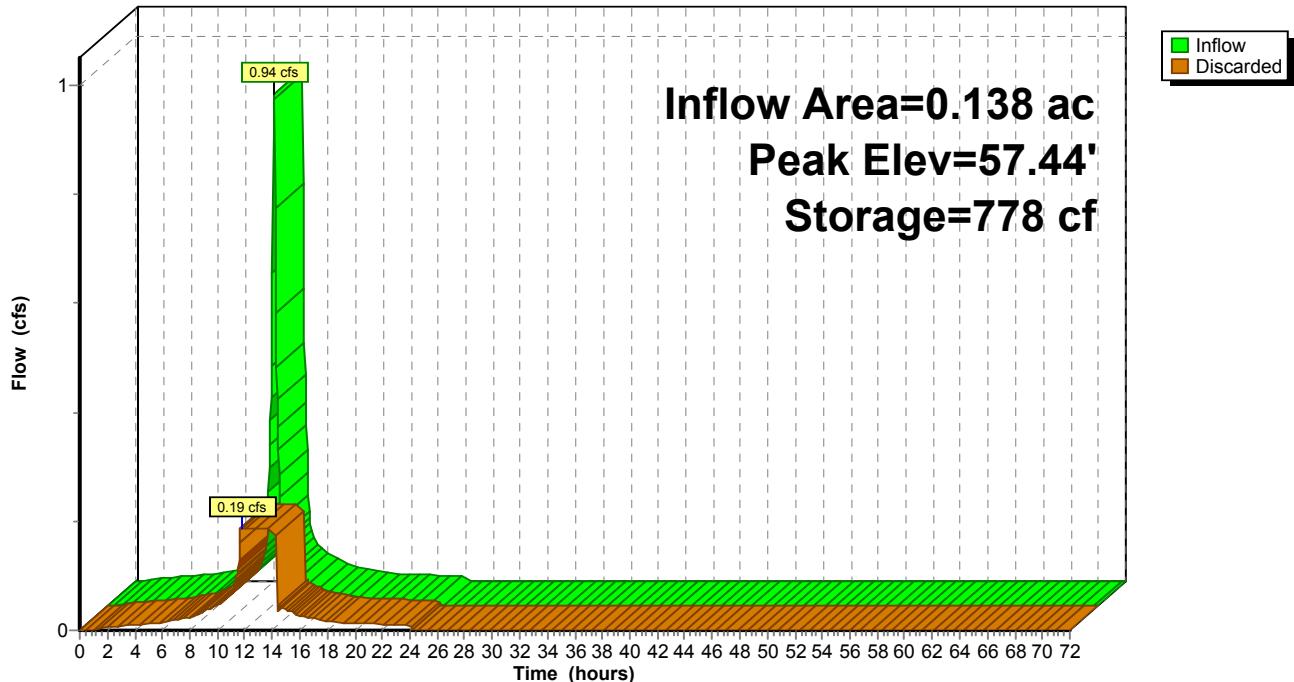
Overall Storage Efficiency = 62.1%

24 Chambers

128.2 cy Field

81.0 cy Stone



Pond P13: Infiltration Chambers**Hydrograph**

Summary for Pond P14: Infiltration Chambers

Inflow Area = 0.173 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 1.18 cfs @ 12.09 hrs, Volume= 0.099 af
 Outflow = 0.13 cfs @ 11.60 hrs, Volume= 0.099 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.13 cfs @ 11.60 hrs, Volume= 0.099 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.67' @ 12.77 hrs Surf.Area= 664 sf Storage= 1,356 cf

Plug-Flow detention time= 67.2 min calculated for 0.099 af (100% of inflow)
 Center-of-Mass det. time= 67.2 min (809.9 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	58.50'	599 cf	11.17'W x 59.50'L x 3.54'H Field A 2,353 cf Overall - 857 cf Embedded = 1,496 cf x 40.0% Voids
#2A	59.00'	857 cf	Cultec R-330XLHD x 16 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
1,455 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	58.50'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.13 cfs @ 11.60 hrs HW=58.55' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.13 cfs)

Pond P14: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

8 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 57.50' Row Length +12.0" End Stone x 2 = 59.50'
Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

16 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 856.9 cf Chamber Storage

2,353.1 cf Field - 856.9 cf Chambers = 1,496.3 cf Stone x 40.0% Voids = 598.5 cf Stone Storage

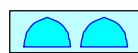
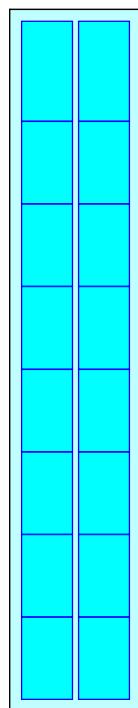
Chamber Storage + Stone Storage = 1,455.4 cf = 0.033 af

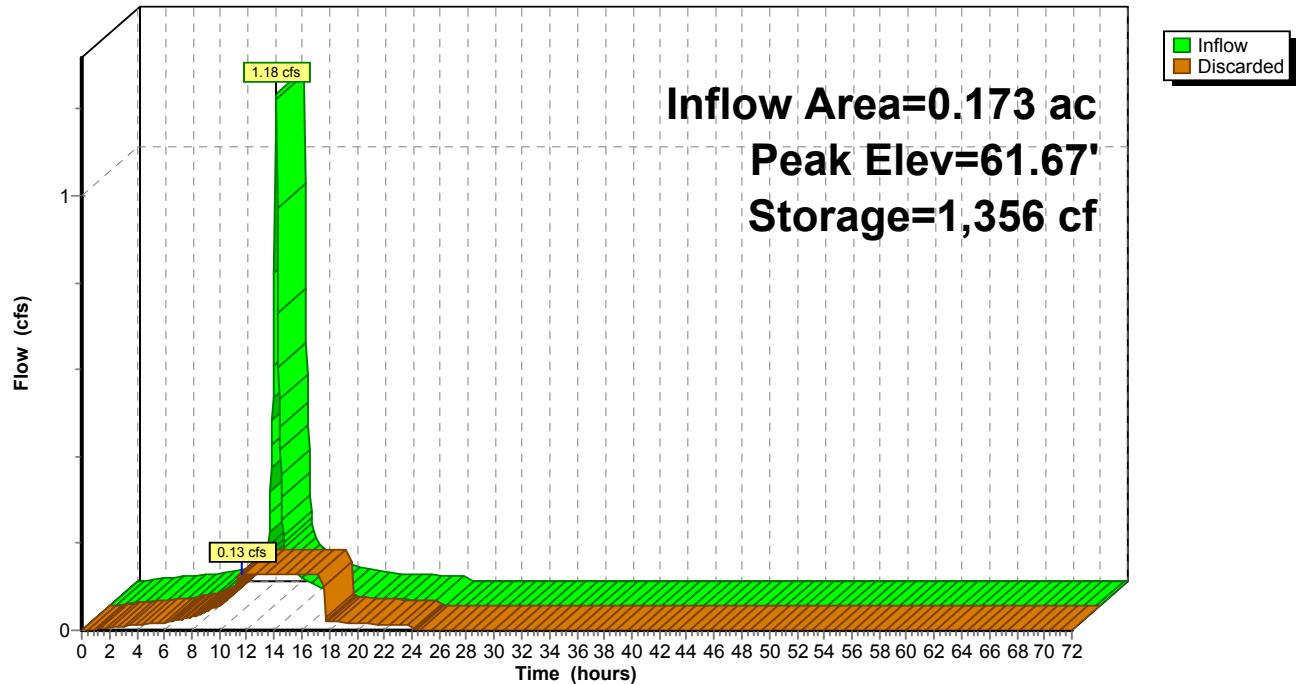
Overall Storage Efficiency = 61.8%

16 Chambers

87.2 cy Field

55.4 cy Stone



Pond P14: Infiltration Chambers**Hydrograph**

Summary for Pond P15: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af
 Outflow = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 62.08' @ 12.63 hrs Surf.Area= 111 sf Storage= 174 cf

Plug-Flow detention time= 47.9 min calculated for 0.014 af (100% of inflow)
 Center-of-Mass det. time= 47.9 min (790.6 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P15: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

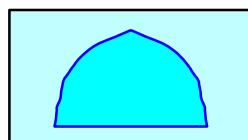
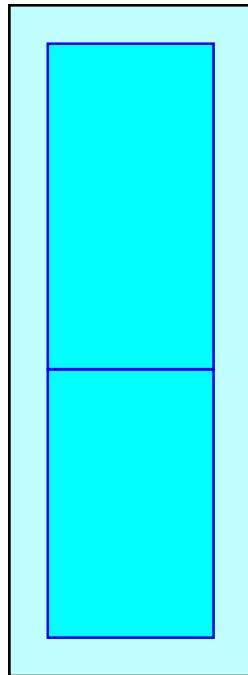
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

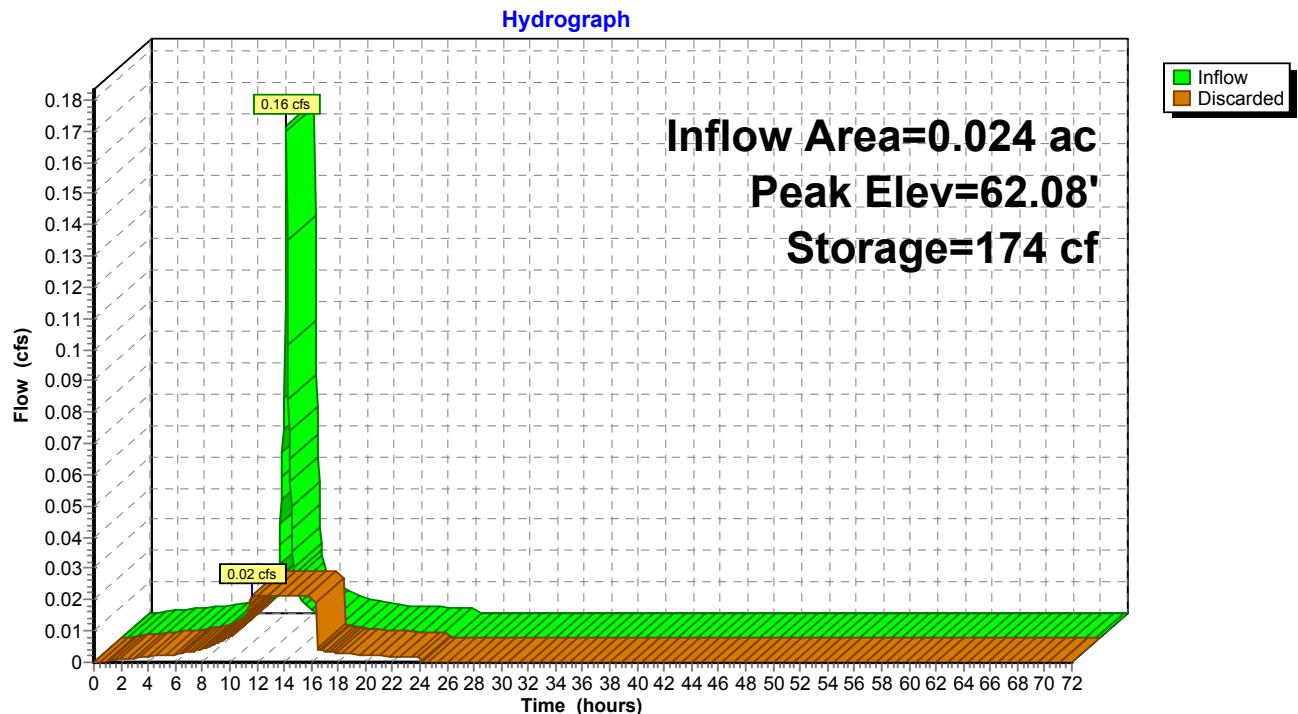
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P15: Infiltration Chambers

Summary for Pond P16: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.014 af
 Outflow = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 62.12' @ 12.63 hrs Surf.Area= 111 sf Storage= 176 cf

Plug-Flow detention time= 48.7 min calculated for 0.014 af (100% of inflow)
 Center-of-Mass det. time= 48.7 min (791.4 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=59.65' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P16: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

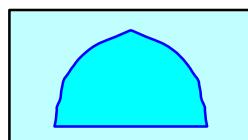
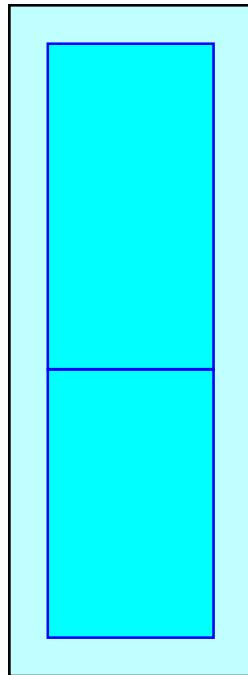
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

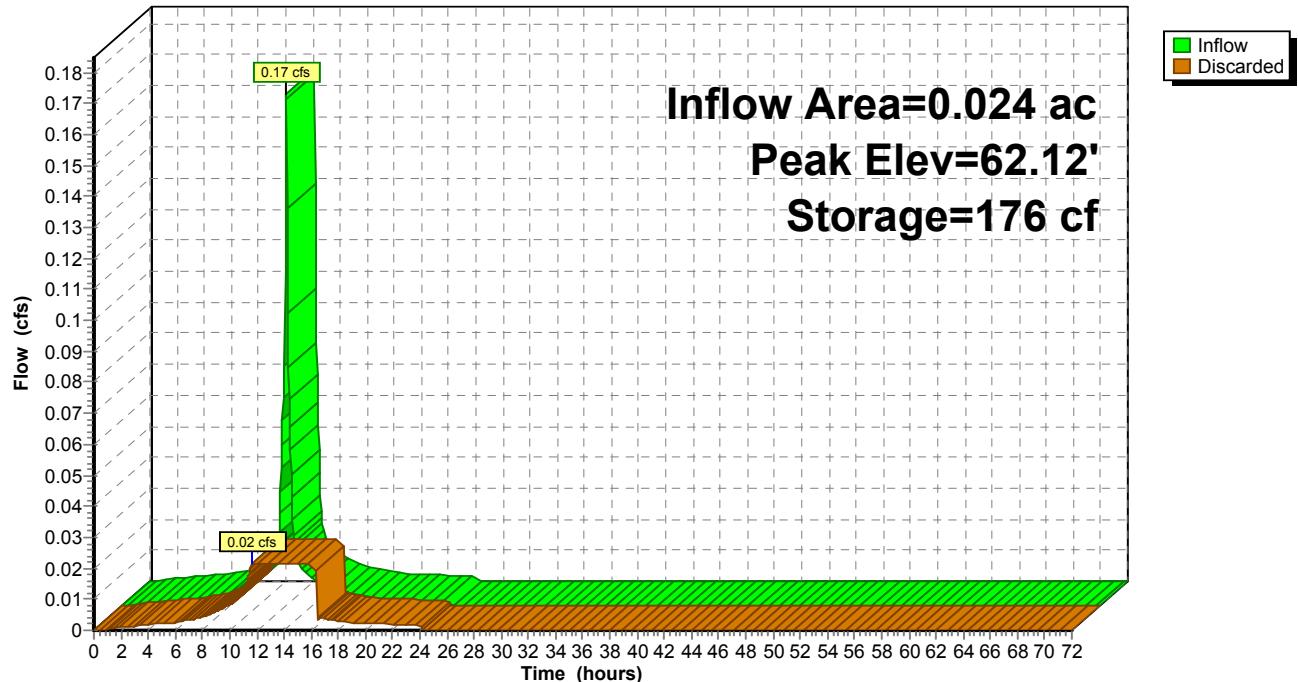
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P16: Infiltration Chambers**Hydrograph**

Summary for Pond P17: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af
 Outflow = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 62.07' @ 12.62 hrs Surf.Area= 111 sf Storage= 172 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 47.5 min (790.2 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P17: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

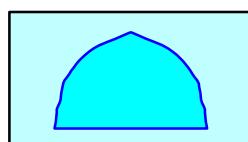
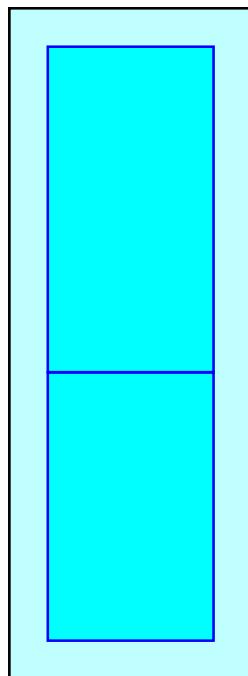
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

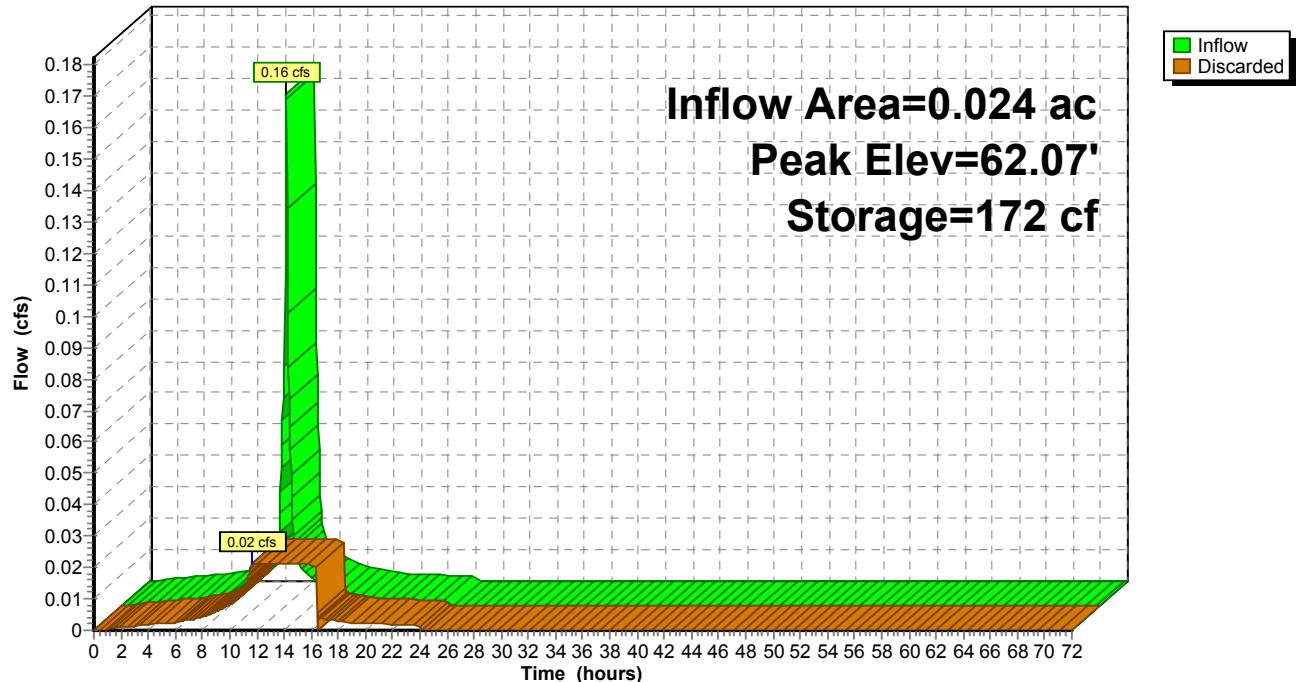
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P17: Infiltration Chambers**Hydrograph**

Summary for Pond P18: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af
 Outflow = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 62.06' @ 12.62 hrs Surf.Area= 111 sf Storage= 172 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 47.3 min (790.0 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P18: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

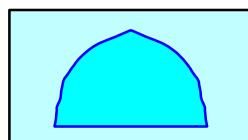
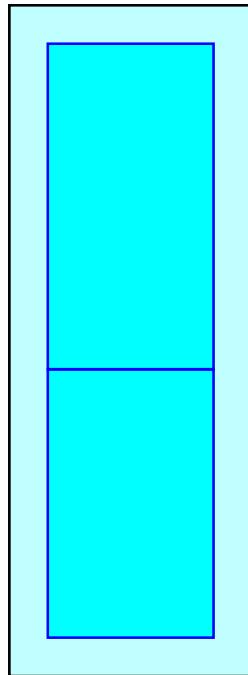
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

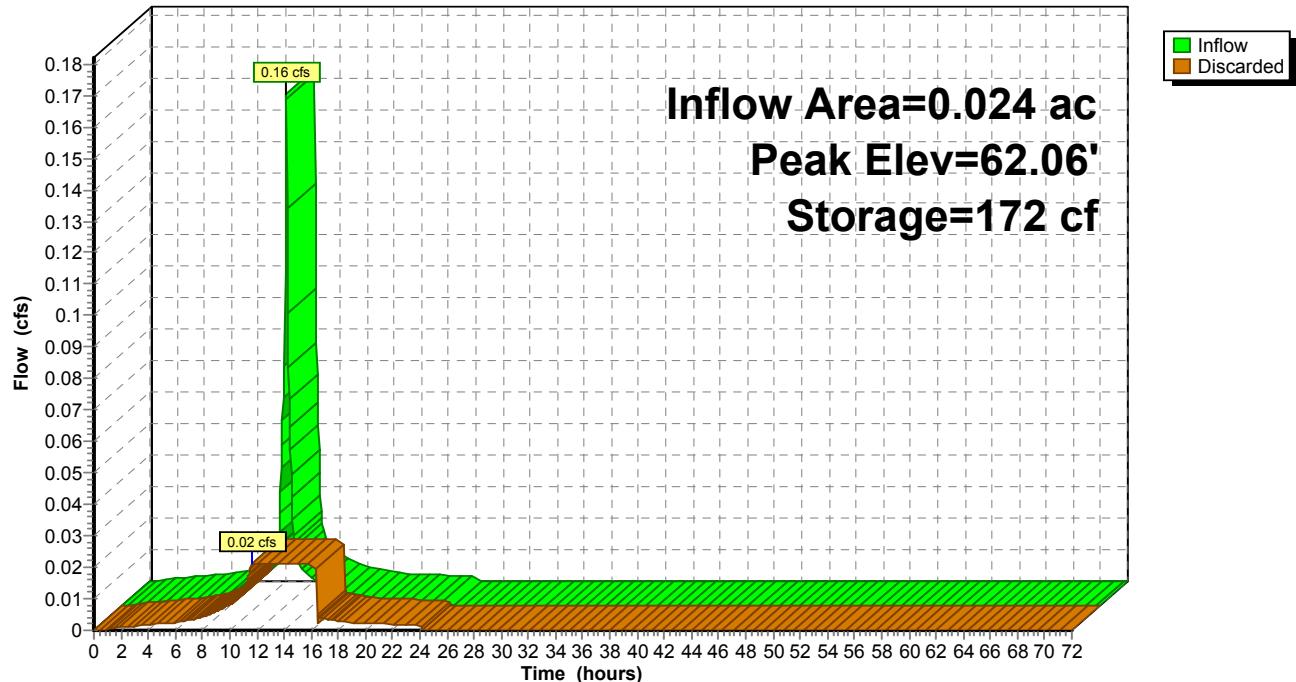
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P18: Infiltration Chambers**Hydrograph**

Summary for Pond P2: Infiltration Chambers

Inflow Area = 0.349 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 2.38 cfs @ 12.09 hrs, Volume= 0.200 af
 Outflow = 0.27 cfs @ 11.60 hrs, Volume= 0.200 af, Atten= 89%, Lag= 0.0 min
 Discarded = 0.27 cfs @ 11.60 hrs, Volume= 0.200 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.01' @ 12.74 hrs Surf.Area= 1,385 sf Storage= 2,693 cf

Plug-Flow detention time= 63.2 min calculated for 0.200 af (100% of inflow)
 Center-of-Mass det. time= 63.2 min (805.9 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	1,194 cf	20.83'W x 66.50'L x 3.54'H Field A 4,907 cf Overall - 1,922 cf Embedded = 2,984 cf x 40.0% Voids
#2A	56.70'	1,922 cf	Cultec R-330XLHD x 36 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
3,116 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.27 cfs @ 11.60 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.27 cfs)

Pond P2: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

9 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 64.50' Row Length +12.0" End Stone x 2 = 66.50'
Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

36 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 1,922.4 cf Chamber Storage

4,906.7 cf Field - 1,922.4 cf Chambers = 2,984.3 cf Stone x 40.0% Voids = 1,193.7 cf Stone Storage

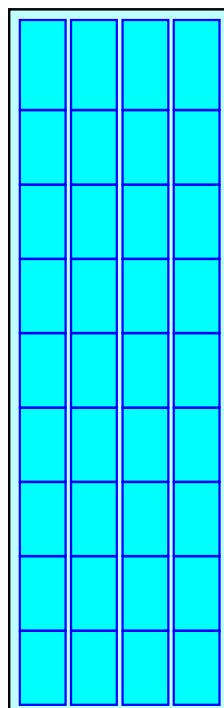
Chamber Storage + Stone Storage = 3,116.1 cf = 0.072 af

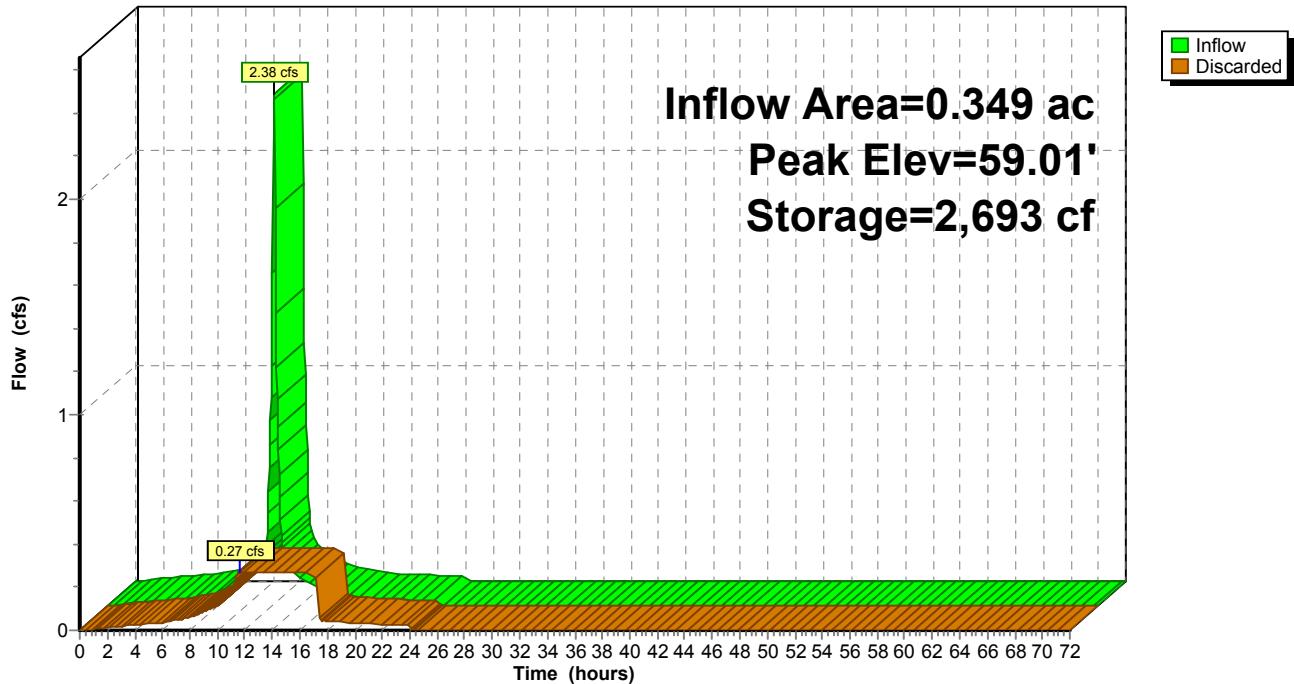
Overall Storage Efficiency = 63.5%

36 Chambers

181.7 cy Field

110.5 cy Stone



Pond P2: Infiltration Chambers**Hydrograph**

Summary for Pond P3: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af
 Outflow = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 58.68' @ 12.63 hrs Surf.Area= 111 sf Storage= 174 cf

Plug-Flow detention time= 47.9 min calculated for 0.014 af (100% of inflow)
 Center-of-Mass det. time= 47.9 min (790.6 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	56.70'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P3: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

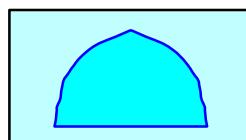
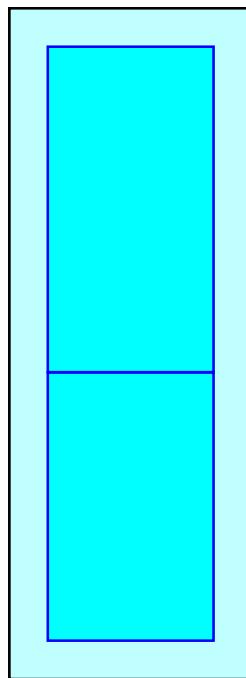
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

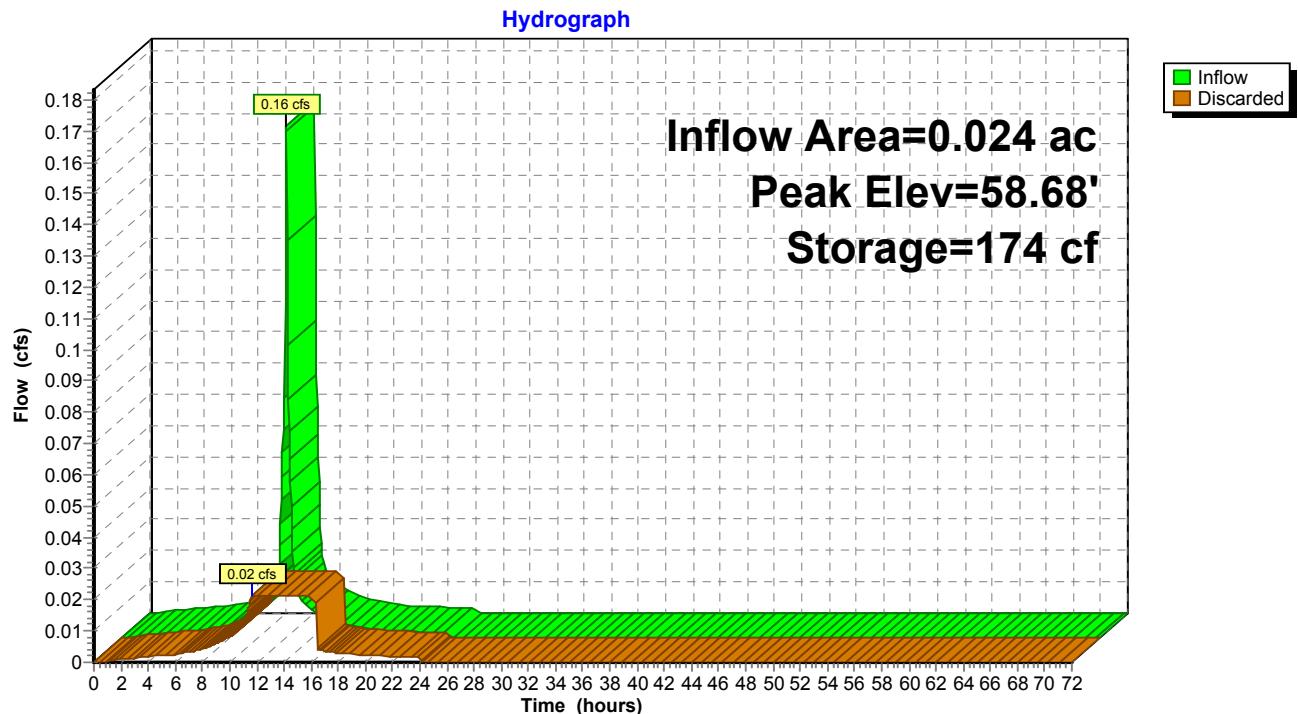
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P3: Infiltration Chambers

Summary for Pond P4: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af
 Outflow = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 58.67' @ 12.62 hrs Surf.Area= 111 sf Storage= 173 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 47.7 min (790.5 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	56.70'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=56.24' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P4: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

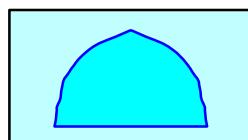
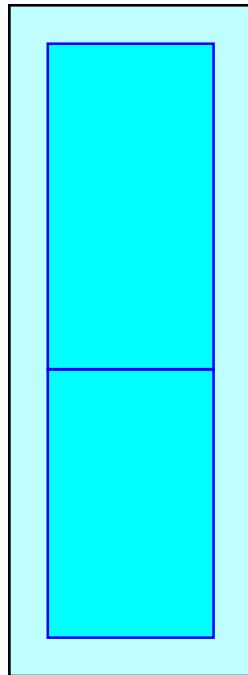
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

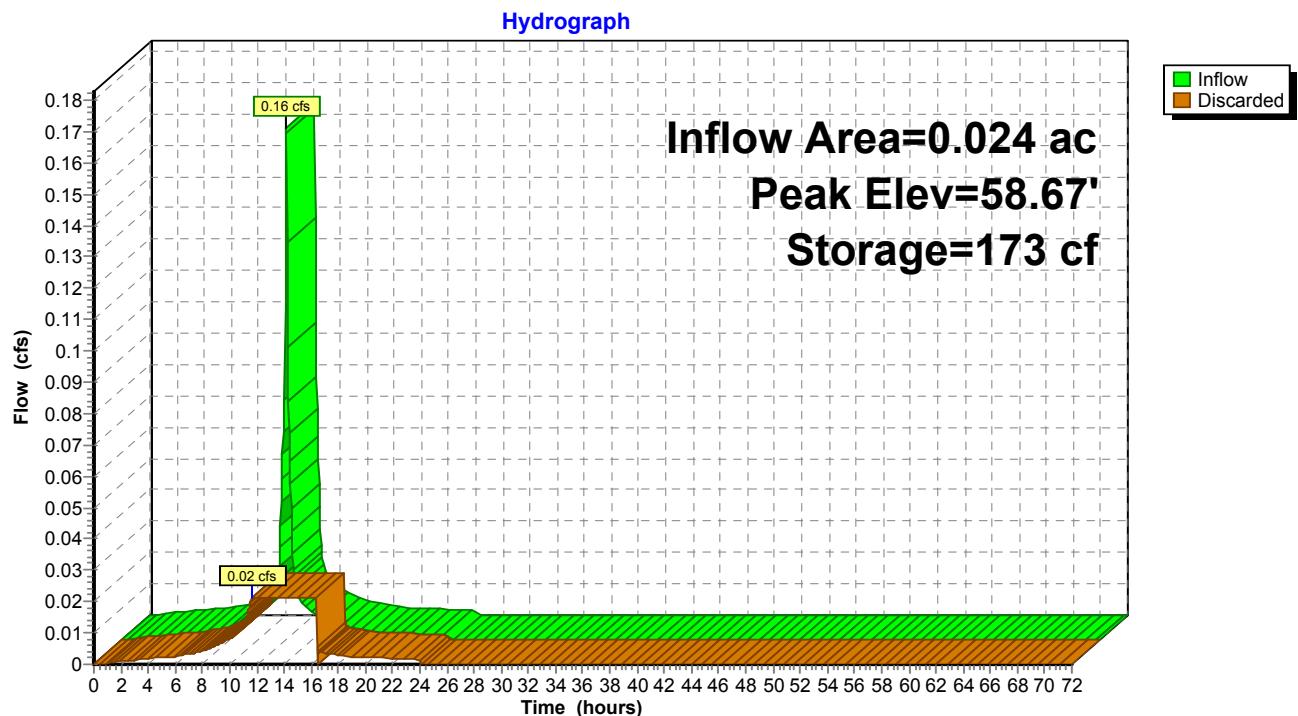
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P4: Infiltration Chambers

Summary for Pond P5: Infiltration Chambers

Inflow Area = 0.039 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.27 cfs @ 12.09 hrs, Volume= 0.022 af
 Outflow = 0.04 cfs @ 11.65 hrs, Volume= 0.022 af, Atten= 85%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.65 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 58.58' @ 12.58 hrs Surf.Area= 208 sf Storage= 264 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 36.6 min (779.4 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	56.20'	167 cf	4.75'W x 43.75'L x 2.54'H Field A 528 cf Overall - 111 cf Embedded = 418 cf x 40.0% Voids
#2A	56.70'	111 cf	Cultec R-150XLHD x 4 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 1 rows
278 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.20'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.04 cfs @ 11.65 hrs HW=56.23' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond P5: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 1 rows

4 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 41.75' Row Length +12.0" End Stone x 2 = 43.75' Base Length

1 Rows x 33.0" Wide + 12.0" Side Stone x 2 = 4.75' Base Width

6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

4 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 1 Rows = 110.6 cf Chamber Storage

528.2 cf Field - 110.6 cf Chambers = 417.6 cf Stone x 40.0% Voids = 167.0 cf Stone Storage

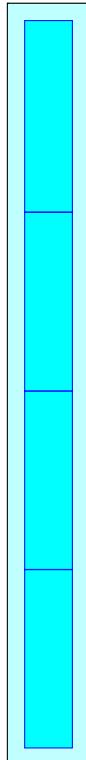
Chamber Storage + Stone Storage = 277.6 cf = 0.006 af

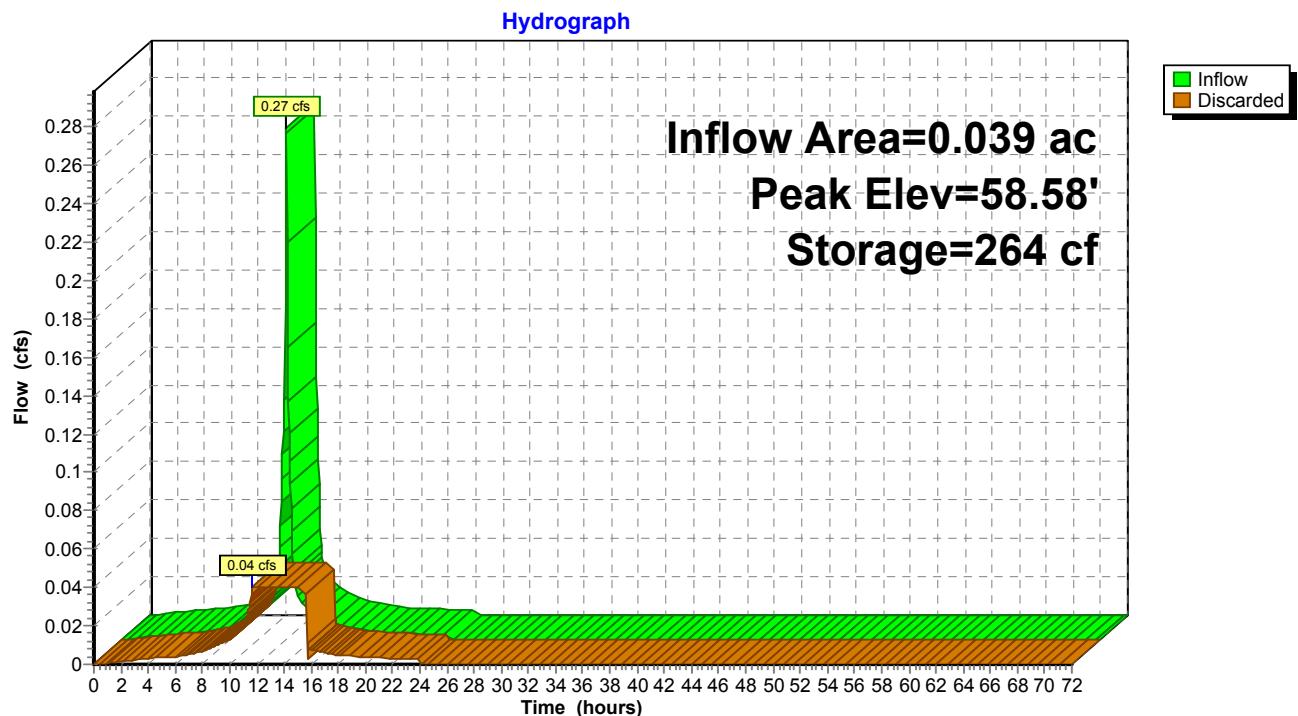
Overall Storage Efficiency = 52.6%

4 Chambers

19.6 cy Field

15.5 cy Stone



Pond P5: Infiltration Chambers

Summary for Pond P6: Infiltration Chambers

Inflow Area = 0.019 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af
 Outflow = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af, Atten= 84%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 61.60' @ 12.56 hrs Surf.Area= 110 sf Storage= 122 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 30.6 min (773.4 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	90 cf	4.75'W x 23.25'L x 2.54'H Field A 281 cf Overall - 56 cf Embedded = 224 cf x 40.0% Voids
#2A	60.10'	56 cf	Cultec R-150XLHD x 2 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 1 rows
146 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P6: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)**

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 1 rows

2 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 21.25' Row Length +12.0" End Stone x 2 = 23.25' Base Length

1 Rows x 33.0" Wide + 12.0" Side Stone x 2 = 4.75' Base Width

6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

2 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 1 Rows = 56.3 cf Chamber Storage

280.7 cf Field - 56.3 cf Chambers = 224.4 cf Stone x 40.0% Voids = 89.8 cf Stone Storage

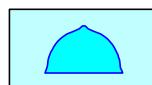
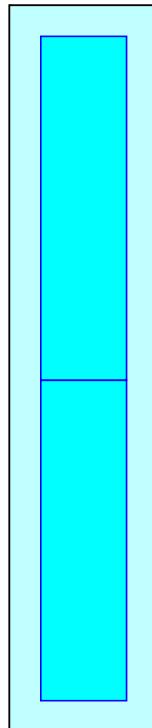
Chamber Storage + Stone Storage = 146.1 cf = 0.003 af

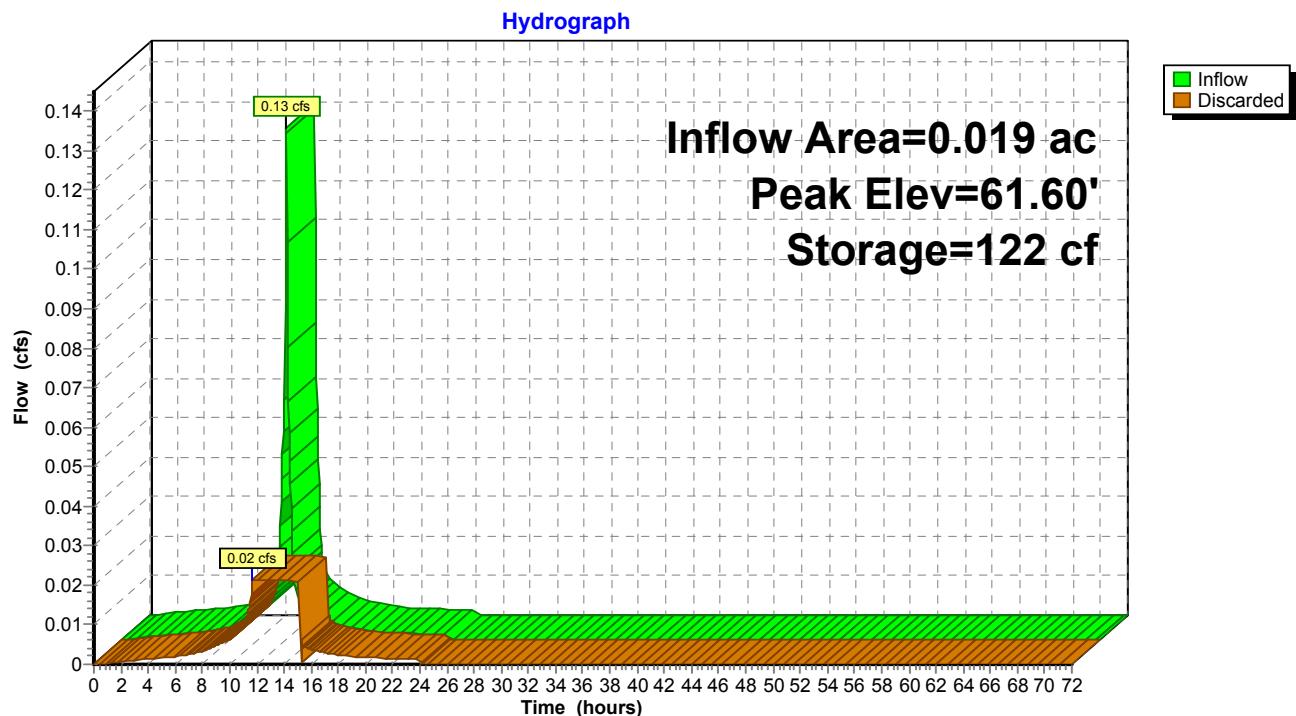
Overall Storage Efficiency = 52.0%

2 Chambers

10.4 cy Field

8.3 cy Stone



Pond P6: Infiltration Chambers

Summary for Pond P7: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af
 Outflow = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 62.08' @ 12.63 hrs Surf.Area= 111 sf Storage= 173 cf

Plug-Flow detention time= 47.8 min calculated for 0.014 af (100% of inflow)
 Center-of-Mass det. time= 47.8 min (790.6 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P7: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

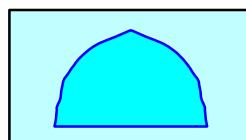
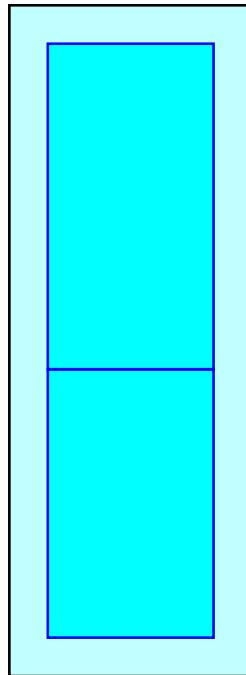
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

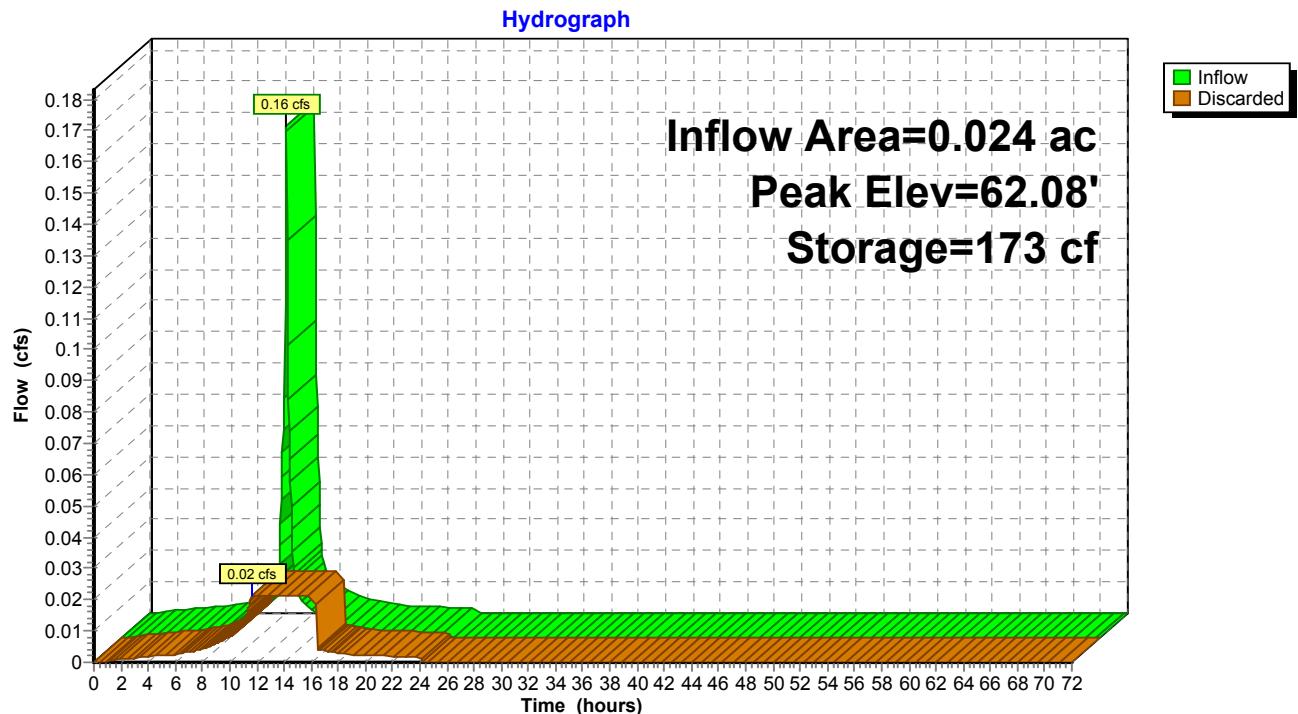
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P7: Infiltration Chambers

Summary for Pond P8: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af
 Outflow = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 62.08' @ 12.63 hrs Surf.Area= 111 sf Storage= 173 cf

Plug-Flow detention time= 47.8 min calculated for 0.014 af (100% of inflow)
 Center-of-Mass det. time= 47.8 min (790.6 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P8: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

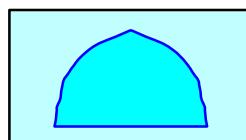
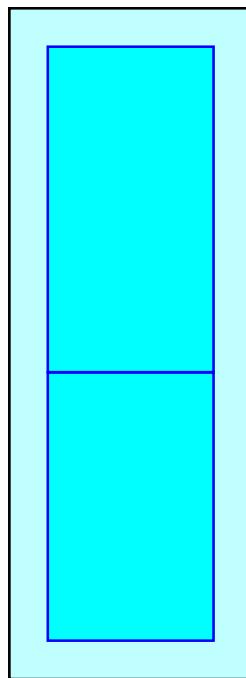
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

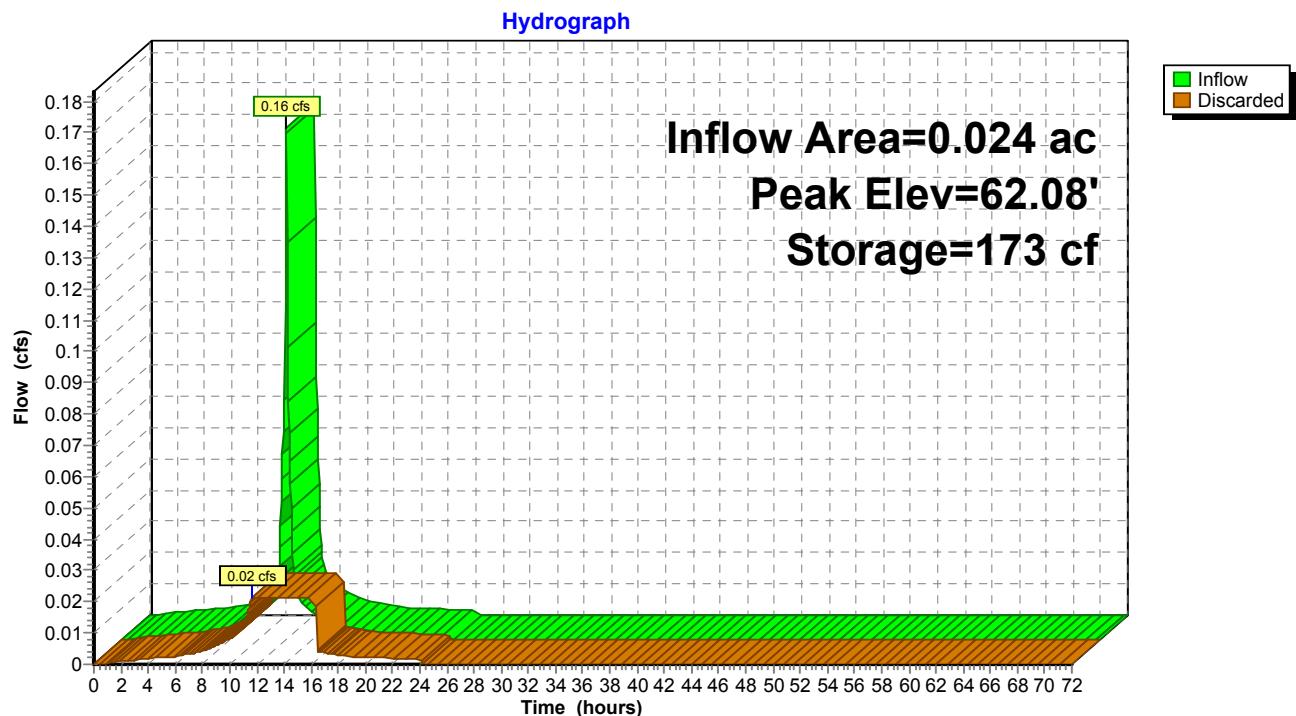
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P8: Infiltration Chambers

Summary for Pond P9: Infiltration Chambers

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 6.86" for 100-Year event
 Inflow = 0.16 cfs @ 12.09 hrs, Volume= 0.014 af
 Outflow = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af, Atten= 87%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.65 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 62.08' @ 12.63 hrs Surf.Area= 111 sf Storage= 174 cf

Plug-Flow detention time= 47.9 min calculated for 0.014 af (100% of inflow)
 Center-of-Mass det. time= 47.9 min (790.6 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	59.60'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	60.10'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
226 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	59.60'	8.270 in/hr Exfiltration over Surface area Phase-In= 0.02'

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=59.64' (Free Discharge)
 ↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond P9: Infiltration Chambers - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'

Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

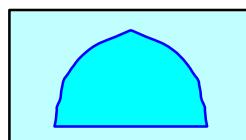
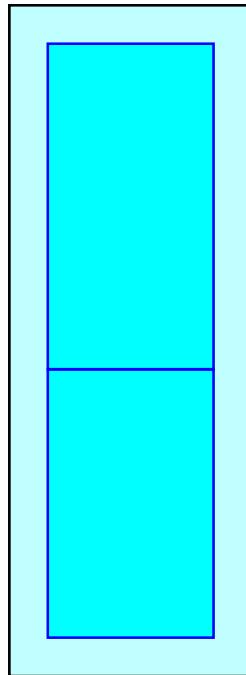
Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

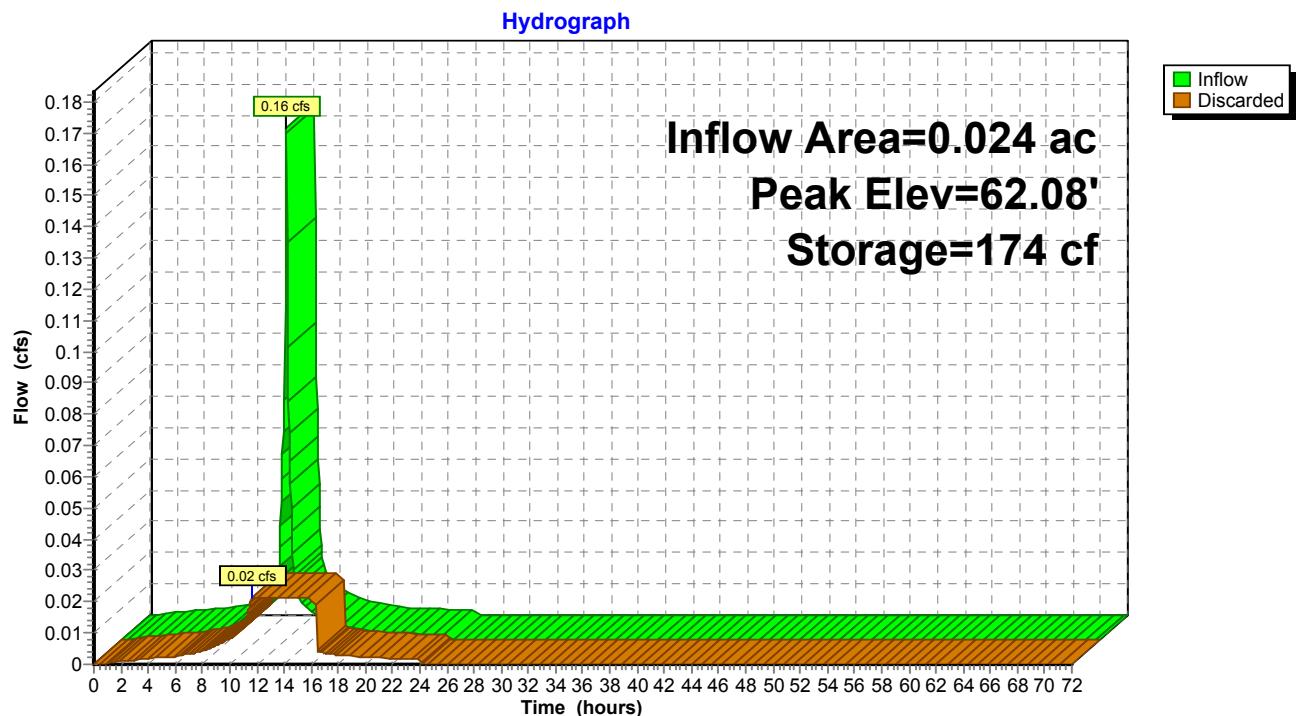
Overall Storage Efficiency = 57.7%

2 Chambers

14.5 cy Field

10.3 cy Stone



Pond P9: Infiltration Chambers

Summary for Pond W1: BVW

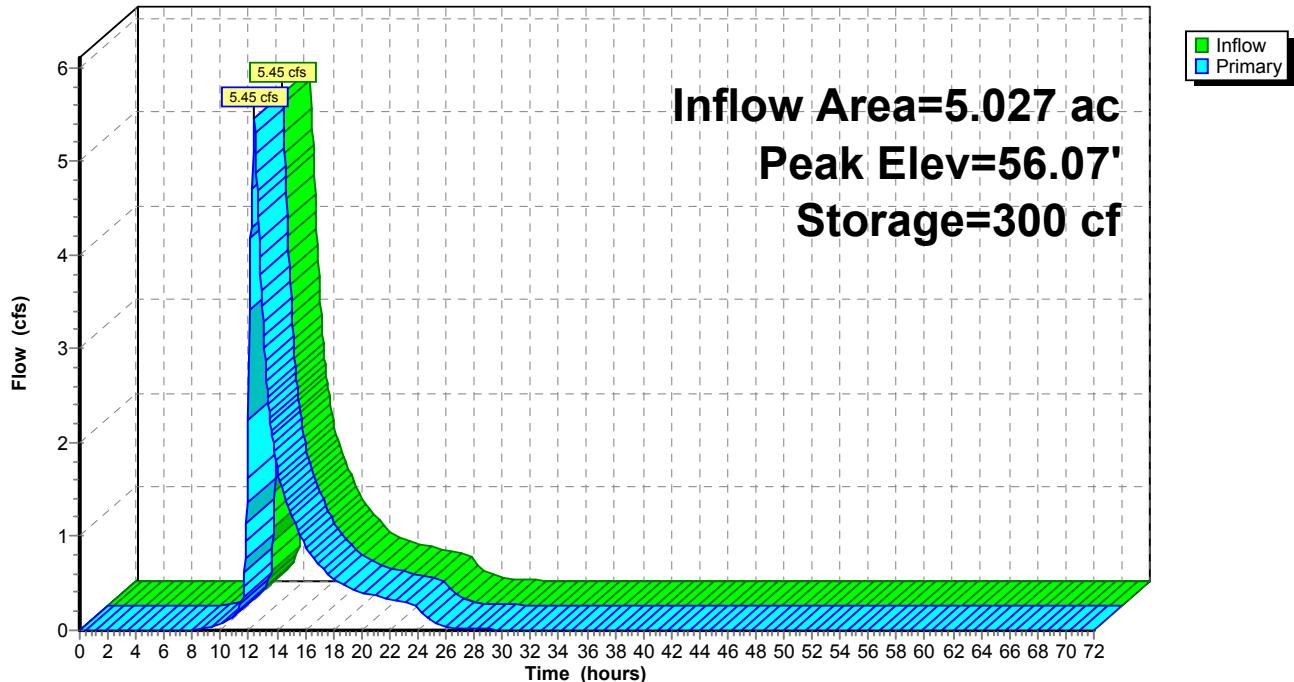
Inflow Area = 5.027 ac, 50.13% Impervious, Inflow Depth = 2.75" for 100-Year event
 Inflow = 5.45 cfs @ 12.38 hrs, Volume= 1.150 af
 Outflow = 5.45 cfs @ 12.39 hrs, Volume= 1.150 af, Atten= 0%, Lag= 0.7 min
 Primary = 5.45 cfs @ 12.39 hrs, Volume= 1.150 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 56.07' @ 12.39 hrs Surf.Area= 4,705 sf Storage= 300 cf

Plug-Flow detention time= 1.5 min calculated for 1.150 af (100% of inflow)
 Center-of-Mass det. time= 1.5 min (907.2 - 905.7)

Volume	Invert	Avail.Storage	Storage Description			
#1	56.00'	11,314 cf	Custom Stage Data (Irregular)	Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
56.00	3,962	413.1	0	0	3,962	
57.00	20,884	797.8	11,314	11,314	41,037	
Device	Routing	Invert	Outlet Devices			
#1	Primary	56.00'	120.0' long x 10.0' breadth Broad-Crested Rectangular Weir			
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60			
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64			

Primary OutFlow Max=5.43 cfs @ 12.39 hrs HW=56.07' TW=0.00' (Dynamic Tailwater)
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 5.43 cfs @ 0.65 fps)

Pond W1: BVW**Hydrograph**

A P P E N D I X C

Soil Testing

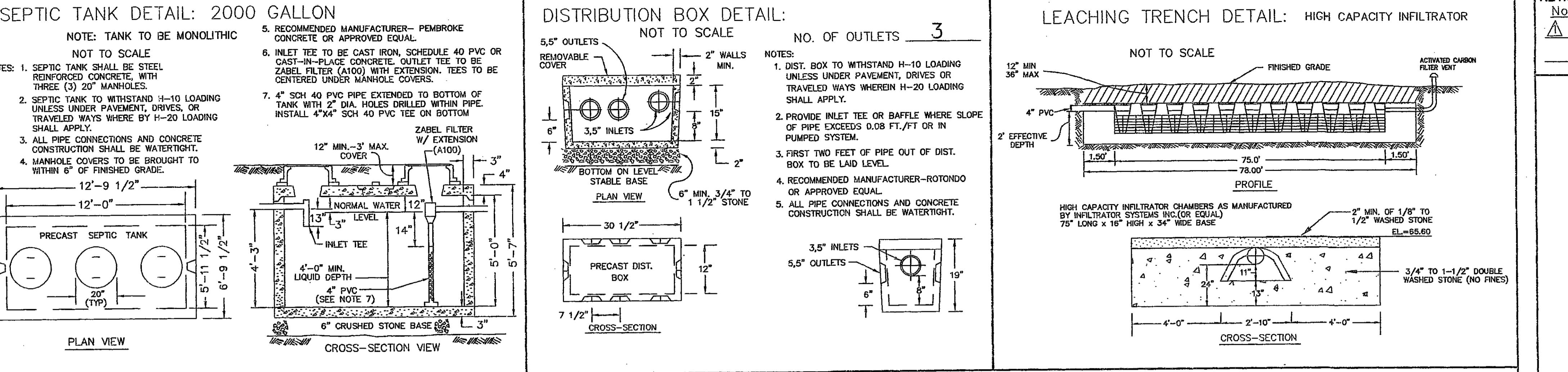
OBSERVATION HOLE DATA						
OBSERVATION HOLE # 101		GRND ELEV.= 61.2	TESTED BY: RALPH COLE			
		GW ELEV.= NOT ENC.	WITNESSED BY: PAUL BROGNA, P.E.	SEACOAST ENGINEERING		
		DATE: 10-22-2003				
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
61.2	0"- 6"	OA	LOAMY SAND	10YR 3/3		FRIABLE
60.7	6"- 11"	C1	GRAVELLY SAND	2.5Y 7/1		LOOSE 10-15% GRAVEL
51.9	112"- 120"	C2	SANDY LOAM	10YR 7/3		HARD
NO GROUNDWATER OBSERVED @ 120" TOP OF PERC 18" PERC RATE < 2 MIN./INCH (ELEV.= 51.2)						

OBSERVATION HOLE DATA						
OBSERVATION HOLE # 102		GRND ELEV.= 61.3	TESTED BY: RALPH COLE			
		GW ELEV.= -	WITNESSED BY: PAUL BROGNA, P.E.	SEACOAST ENGINEERING		
		DATE: 10-22-2003		CERTIFIED BY: RALPH COLE		
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
61.3	0"- 10"	A	SANDY LOAM	10YR 4/3		FRIABLE
60.5	10"- 57"	C1	GRAVELLY SAND	2.5Y 7/1	Y 57" 7.5YR 5/8	LOOSE GRAVELLY SAND
56.6	57"- 84"	C2	SANDY LOAM	10YR 7/3		HARD
SOIL MOTTLES OBSERVED @ 57" TOP OF PERC - PERC RATE < 2 MIN./INCH (ELEV.= 56.6)						

OBSERVATION HOLE DATA						
OBSERVATION HOLE # 103		GRND ELEV.= 63.5	TESTED BY: RALPH COLE			
		GW ELEV.= NOT ENC.	WITNESSED BY: PAUL BROGNA, P.E.	SEACOAST ENGINEERING		
		DATE: 10-22-2003		CERTIFIED BY: RALPH COLE		
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
63.5	0"- 10"	A	SANDY LOAM	10YR 4/3		FRIABLE
62.7	10"- 58"	C1	GRAVELLY SAND	2.5Y 7/1		LOOSE GRAVELLY SAND
58.9	58"- 72"	C2	SANDY LOAM	10YR 7/3		HARD
57.5	72" LEDGE	LEDGE				LEDGE
LEDGE OBSERVED @ 72" TOP OF PERC - PERC RATE < 2 MIN./INCH (ELEV.= 57.5)						

OBSERVATION HOLE DATA						
OBSERVATION HOLE # 104		GRND ELEV.= 61.4	TESTED BY: RALPH COLE			
		GW ELEV.= -	WITNESSED BY: PAUL BROGNA, P.E.	SEACOAST ENGINEERING		
		DATE: 10-23-2003		CERTIFIED BY: RALPH COLE		
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
61.4	0"- 14"	AO	LOAMY SAND	10YR 4/3		FRIABLE
60.2	14"-130"	C	GRAVEL	2.5Y 7/1	Y 57" 7.5YR 5/8	LOOSE GRAVELLY SAND
50.6	LEDGE				LEDGE	LEDGE
SOIL MOTTLES OBSERVED @ 57" TOP OF PERC 31" PERC RATE < 2 MIN./INCH (ELEV.= 56.7)						

OBSERVATION HOLE DATA						
OBSERVATION HOLE # 105		GRND ELEV.= 63.9	TESTED BY: RALPH COLE			
		GW ELEV.= NOT ENC.	WITNESSED BY: PAUL BROGNA, P.E.	SEACOAST ENGINEERING		
		DATE: 10-23-2003		CERTIFIED BY: RALPH COLE		
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
63.9	0"- 10"	OA	LOAMY SAND	10YR 4/3		FRIABLE
63.1	10"- 82"	C	GRAVEL	2.5Y 7/1		LOOSE GRAVEL 20-25% MEDIUM SAND
57.1	82"- 82"					
NO GROUNDWATER OBSERVED @ 82" TOP OF PERC 24" PERC RATE < 2 MIN./INCH (ELEV.= 57.1)						



REVISIONS:
No. **DATE**
No. **REV. THIS SHT.** **DATE**

PHILLIP SPATH P.E. **DATE**

PREPARED BY:
ROSANO • DAVIS • SPATH
ENGINEERING
9 ROCKY LANE
COHASSET, MA 02025
781-383-1234

SURVEY SERVICES PROVIDED BY:
mr SURVEYING, INC.
P.O. BOX 5104
NORWELL, MA 02061

PROJECT TITLE:
SEWAGE DISPOSAL SYSTEM DESIGN
AT
LOT 1 VIKING LANE
HINGHAM, MA
ASSESSORS' MAP 124, LOT 24

PREPARED FOR:
XERXES REALTY TRUST
293 Washington Street
Norwell, MA 02061

DATE: SEPT. 12, 2005
COMP./DESIGN: P.H.SPATH
CHECK: P.H.SPATH / R.H.COLE
DRAWN: M.W.C.
FIELD: M.W.C./J.B.T. **VIKING LOT 1.DWG**
RDS JOB # RDS 458 **mr JOB #** mr-415 **2 SHEET OF 2**

OBSERVATION HOLE DATA

TESTED BY: RALPH COLE	GRND ELEV.= 63.6	WITNESSED BY: PAUL BROGNA, P.E.
	GW ELEV.= -	SEACOAST ENGINEERING
	HOLE # 201	
	MOTTLING ELEV.= 57.4	CERTIFIED BY: RALPH COLE
DATE: 10-22-2003		

ELEV. 63.6	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
63.4	0"- 3"	OA	LOAMY SAND	10YR 4/3		FRIABLE
57.4	3"- 75"	C1	GRAVELLY SAND	2.5Y 7/1	NONE	LOOSE 15-20% GRAVEL
56.7	75"- 83"	C2	FINE LOAMY SAND	10YR 7/2	Y 75" 7.5YR 5/8	HARD

SOIL MOTTLES OBSERVED @ 75" (ELEV.= 57.4) TOP OF PERC 6" HOLE @ ELEV. 63.1 PERC RATE < 2 MIN./INCH

OBSERVATION HOLE DATA

TESTED BY: RALPH COLE	GRND ELEV.= 64.5	WITNESSED BY: PAUL BROGNA, P.E.
	GW ELEV.= -	SEACOAST ENGINEERING
	HOLE # 202	
	MOTTLING ELEV.= -	CERTIFIED BY: RALPH COLE
DATE: 10-22-2003		

ELEV. 64.5	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
64.3	0"- 3"	A FILL	SANDY LOAM	10YR 4/3		FRIABLE
53.9	3"-127"	C1	GRAVELLY SAND	2.5Y 7/1	NONE	LOOSE 20-25% GRAVEL

NO SOIL MOTTLES OBSERVED @ 127" (ELEV.= 53.9) TOP OF PERC 6" HOLE @ ELEV. 64.0 PERC RATE < 2 MIN./INCH

OBSERVATION HOLE DATA

TESTED BY: RALPH COLE	GRND ELEV.= 65.3	WITNESSED BY: PAUL BROGNA, P.E.
	GW ELEV.= -	SEACOAST ENGINEERING
	HOLE # 203	
	MOTTLING ELEV.= -	CERTIFIED BY: RALPH COLE
DATE: 10-22-2003		

ELEV. 65.3	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
64.3	0"- 12"	A FILL	SANDY LOAM	10YR 4/3		FRIABLE
60.9	12"- 53"	C1	GRAVELLY SAND	2.5Y 7/1		LOOSE GRAVEL, SAND
60.9	53"	LEDGE				LEDGE

LEDGE OBSERVED @ 53.0 (ELEV.= 60.9) TOP OF PERC - HOLE @ ELEV. - PERC RATE - MIN./INCH

OBSERVATION HOLE DATA

TESTED BY: RALPH COLE	GRND ELEV.= 65.2	WITNESSED BY: PAUL BROGNA, P.E.
	GW ELEV.= -	SEACOAST ENGINEERING
	HOLE # 204	
	MOTTLING ELEV.= 59.0	CERTIFIED BY: RALPH COLE
DATE: 10-23-2003		

ELEV. 65.2	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
65.0	0"- 3"	AO	LOAMY SAND	10YR 4/3		FRIABLE
59.0	3"- 75"	C1	GRAVELLY SAND	2.5Y 7/1	NONE	LOOSE GRAVELLY SAND
56.9	75"-100"	C2	SANDY LOAM	10YR 7/3	Y 75" 7.5YR 5/8	HARD

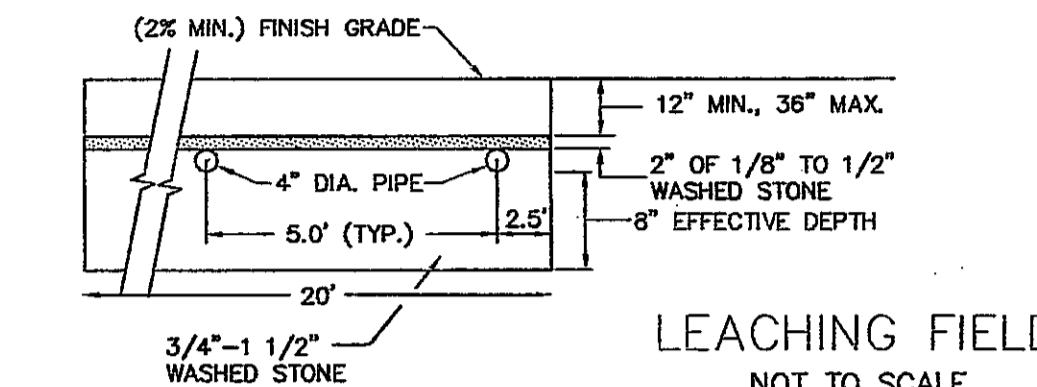
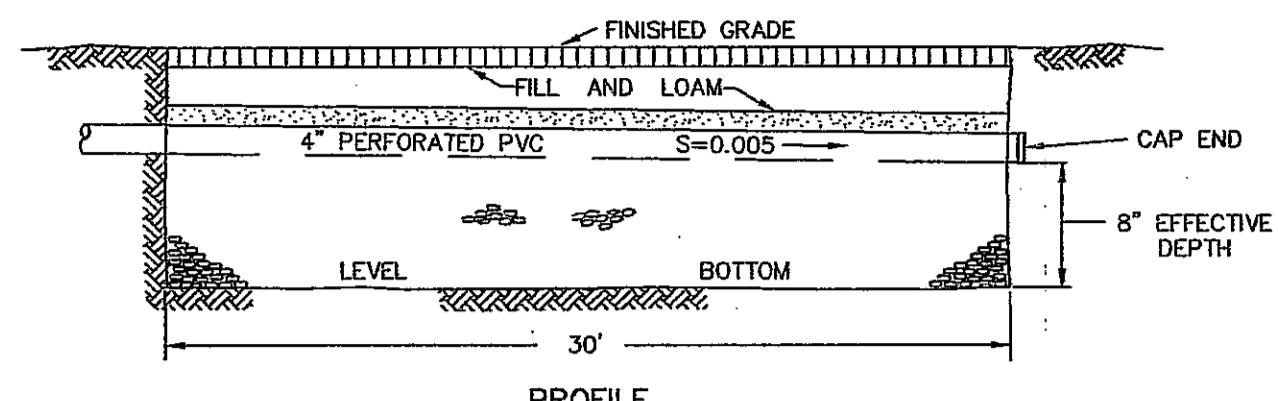
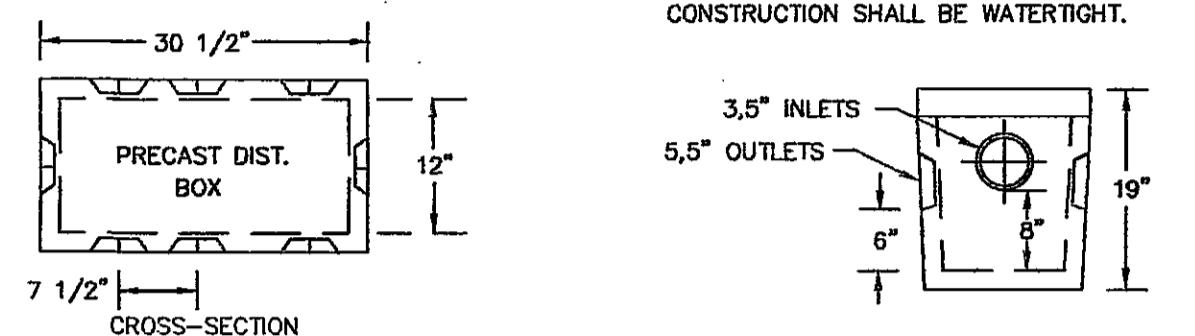
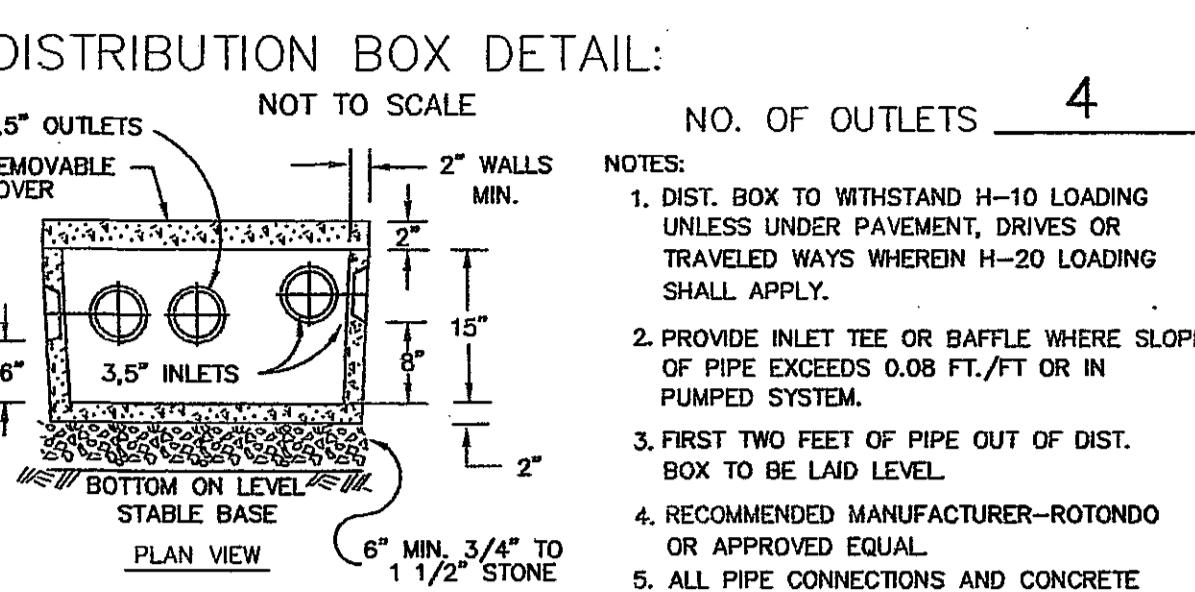
SOIL MOTTLES OBSERVED @ 75" (ELEV.= 59.0) TOP OF PERC 12" HOLE @ ELEV. 64.2 PERC RATE < 2 MIN./INCH

OBSERVATION HOLE DATA

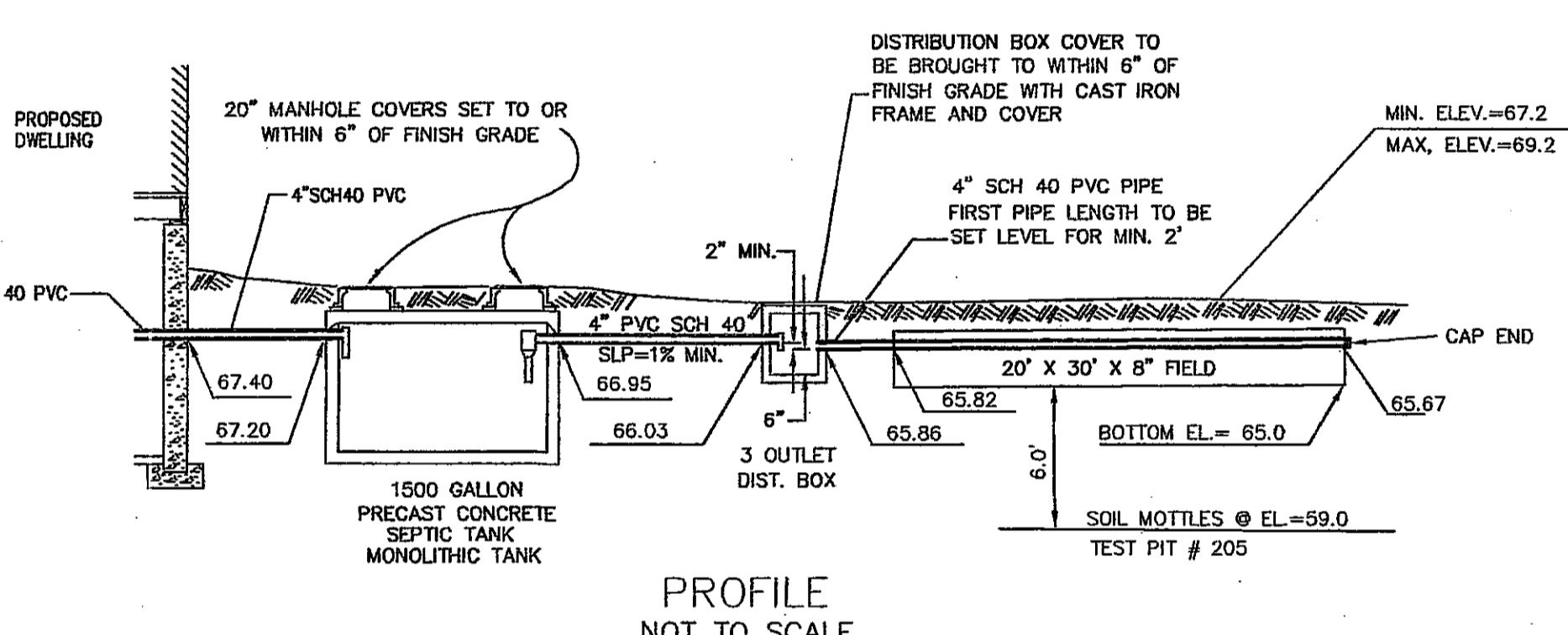
TESTED BY: RALPH COLE	GRND ELEV.= 67.2	WITNESSED BY: PAUL BROGNA, P.E.
	GW ELEV.= -	SEACOAST ENGINEERING
	HOLE # 205	
	MOTTLING ELEV.= -	CERTIFIED BY: RALPH COLE
DATE: 10-23-2003		

ELEV. 67.2	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
67.0	0"- 3"	OA	LOAMY SAND	10YR 4/3		FRIABLE
60.4	3"- 82"	C1	GRAVEL SAND	2.5Y 7/1		LOOSE GRAVEL 10-15%

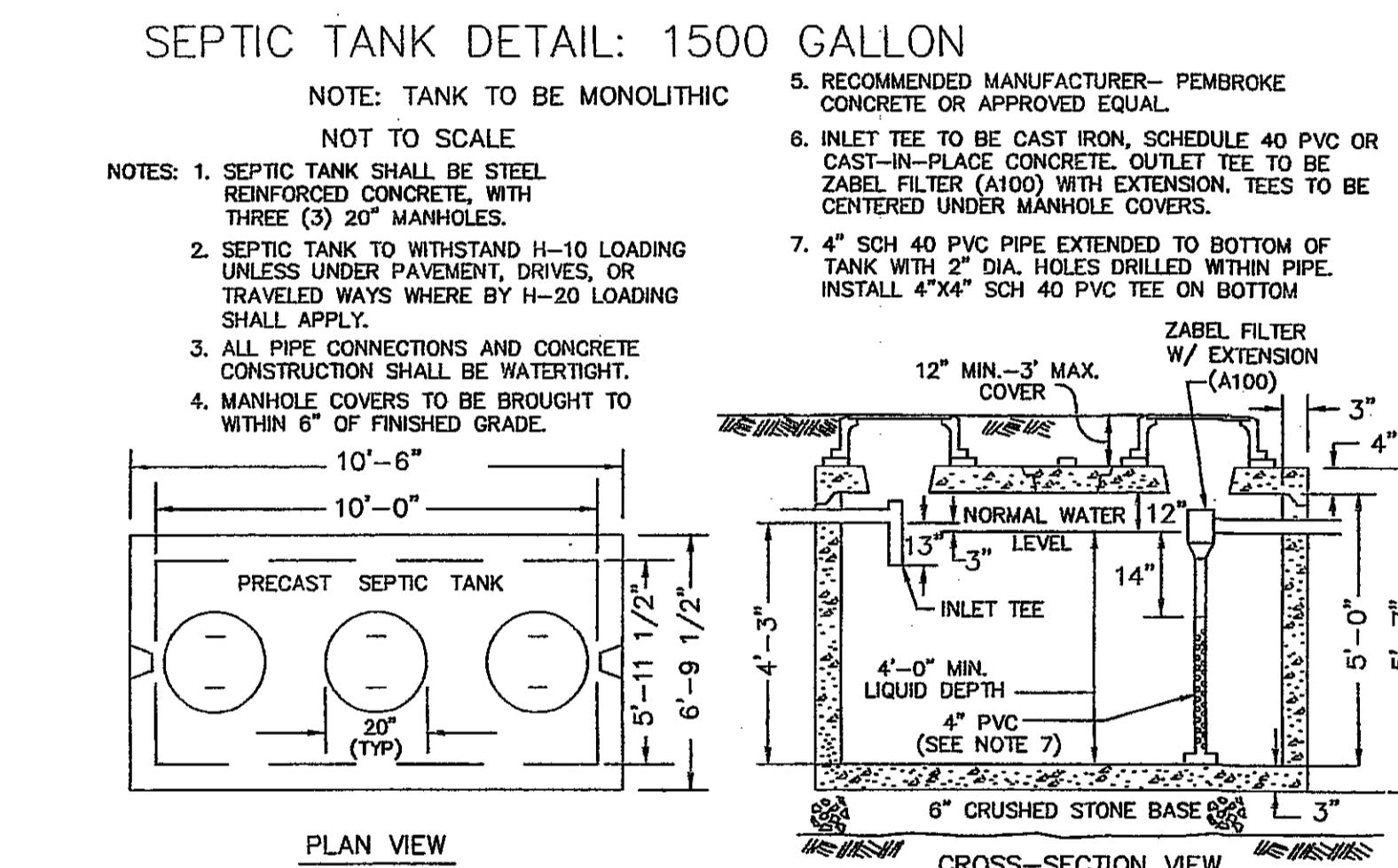
NO SOIL MOTTLES OBSERVED @ 82" (ELEV.= 60.4) TOP OF PERC 12" HOLE @ ELEV. 66.2 PERC RATE < 2 MIN./INCH



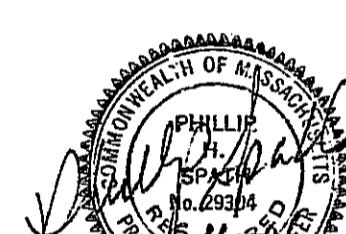
LEACHING FIELD
NOT TO SCALE



PROFILE
NOT TO SCALE



REVISIONS:	DATE
REV. SAS	5-16-06



PHILLIP SPATH P.E. DATE

PREPARED BY:
ROSANO • DAVIS • SPATH
ENGINEERING
9 ROCKY LANE
COHASSET, MA 02025
781-383-1234

SURVEY SERVICES PROVIDED BY:
mr SURVEYING, INC.
P.O. BOX 5104
NORWELL, MA 02061

PROJECT TITLE:
SEWAGE DISPOSAL
SYSTEM DESIGN
AT
LOT 2 VIKING LANE
HINGHAM, MA
ASSESSORS' MAP 124, LOT 24

PREPARED FOR:
XERXES
REALTY TRUST
293 WASHINGTON STREET
NORWELL, MA 02061
DATE: JUNE 27, 2005
COMP./DESIGN: P.H.SPATH
CHECK: P.H.SPATH / R.H.COLE
DRAWN: M.W.C.
FIELD: M.W.C./J.B.T. LOT 2 VIKING LANE
RDS JOB # RDS 458 SHEET
mr job # mr- 2 OF 2

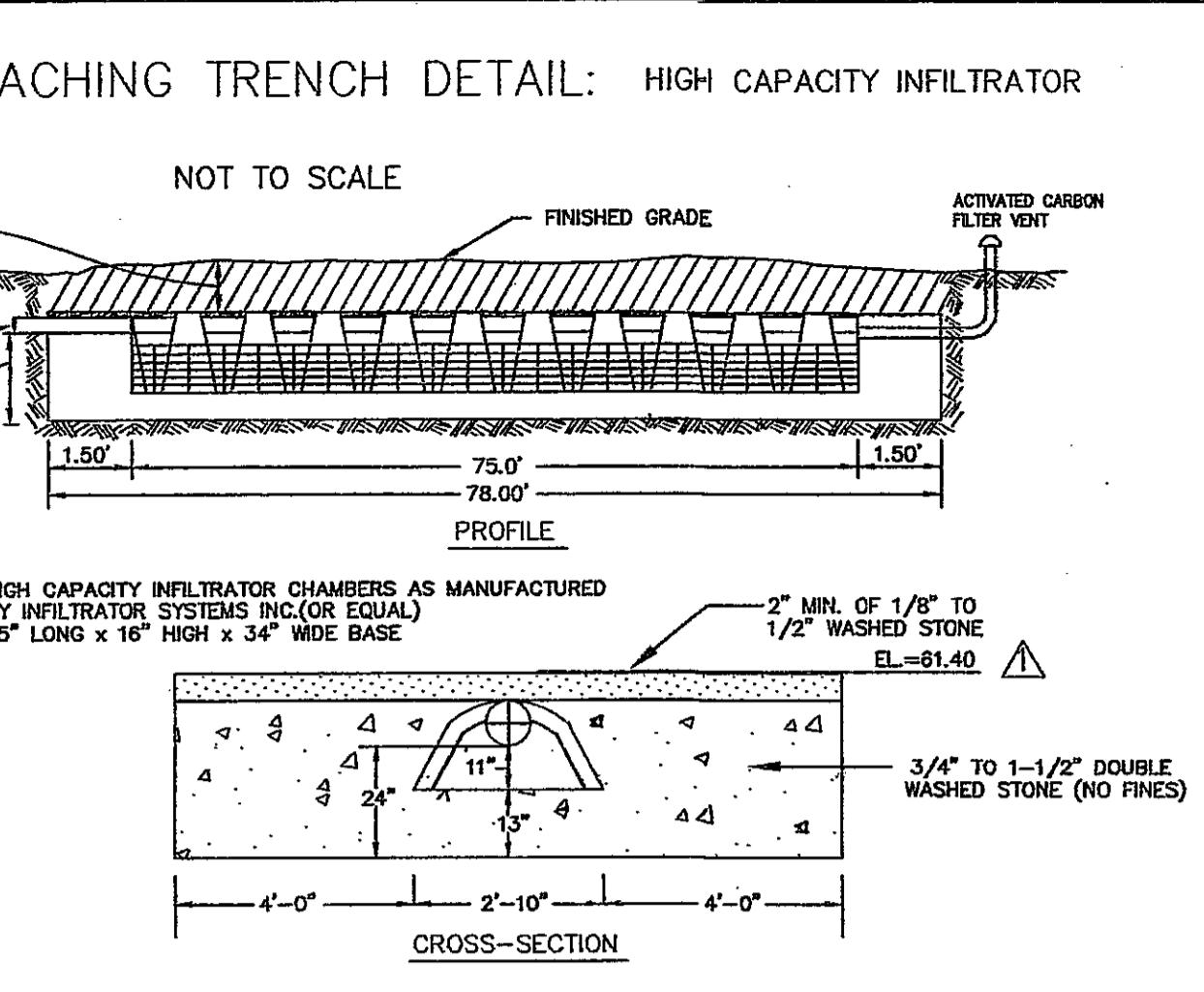
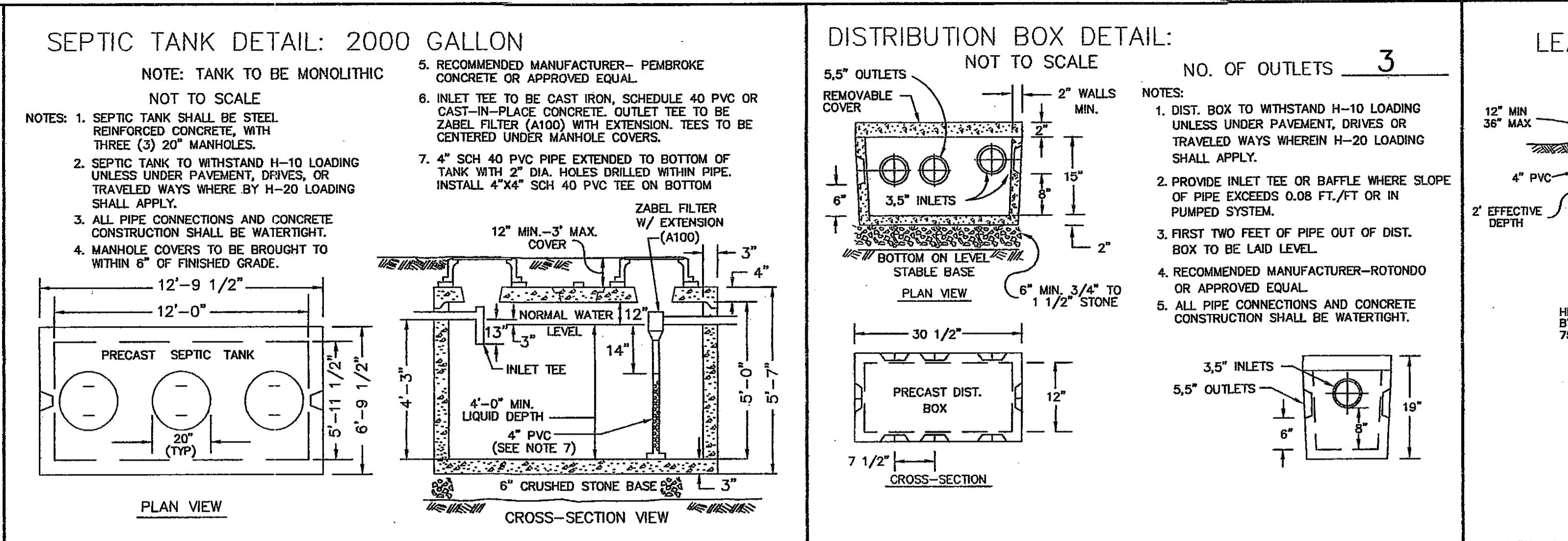
OBSERVATION HOLE DATA

PHILIP SPATH P.E. &
Ralph Cole P.L.S.
TESTED BY:
WITNESSED BY: PAUL A BROGNA P.E.

GRND ELEV.= 62.0
GW ELEV.=
HOLE # 301
DATE: 10-22-2003
MOTTING ELEV.= 52.9 CERTIFIED BY: PHILIP SPATH P.E.

ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
60.7	0"- 16"	A	SANDY LOAM	10YR 4/3		FRIABLE
59.5	16"- 30"	B	LOAMY SAND	10YR 5/8	NONE	10-15% GRAVEL
52.0	30"-120"	C	GRAVELLY SAND	2.5Y 7/4	Y 109° 7.5YR 5/8	LOOSE 10-15% GRAVEL VEINS OF MEDIUM SAND

SOIL MOTTLES OBSERVED @ 109° TOP OF PERC 18" PERC RATE (ELEV.= 52.9) HOLE @ ELEV. 60.5 2 MIN./INCH



OBSERVATION HOLE DATA

PHILIP SPATH P.E. &
Ralph Cole P.L.S.
TESTED BY:
WITNESSED BY: PAUL A BROGNA P.E.

GRND ELEV.= 62.9
GW ELEV.=
HOLE # 302
DATE: 10-22-2003 NO MOTTING ELEV.= 51.9 CERTIFIED BY: PHILIP SPATH P.E.

ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
62.2	0"- 8"	A	SANDY LOAM	10YR 4/3		FRIABLE
60.4	8"- 30"	B	SANDY LOAM	10YR 5/8	NONE	FRIABLE
51.9	30"-132"	C	GRAVELLY SAND	2.5Y 7/1	NONE	LOOSE 15-20% GRAVEL

NO SOIL MOTTLES OBSERVED @ 132" TOP OF PERC 17" PERC RATE (ELEV.= 51.9) HOLE @ ELEV. 61.5 <2 MIN./INCH

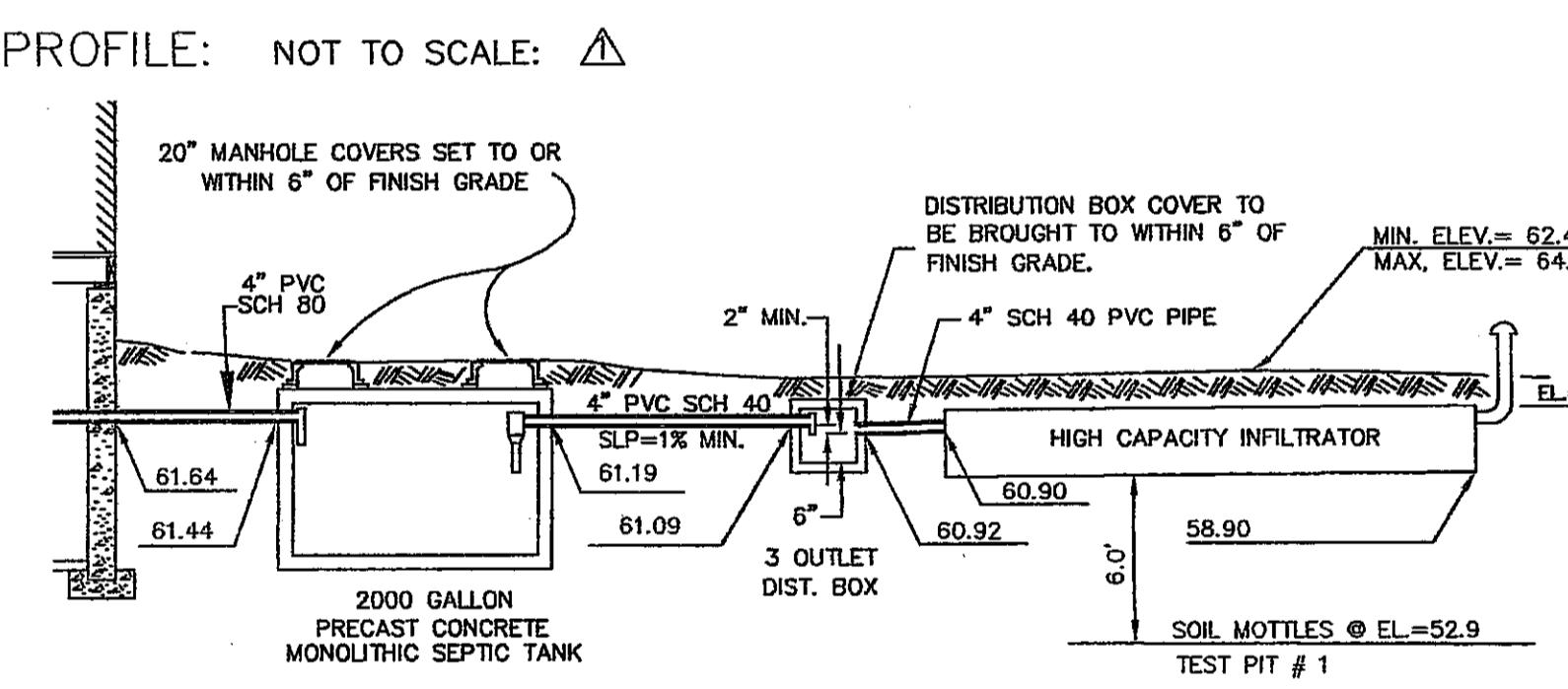
OBSERVATION HOLE DATA

PHILIP SPATH P.E. &
Ralph Cole P.L.S.
TESTED BY:
WITNESSED BY: PAUL A BROGNA P.E.

GRND ELEV.= 65.1
GW ELEV.=
HOLE # 303
DATE: 10-22-2003 NO MOTTING ELEV.= 54.1 CERTIFIED BY: PHILIP SPATH P.E.

ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
64.6	0"- 6"	A	SANDY LOAM	10YR 4/3		FRIABLE
63.1	6"- 24"	B	SANDY LOAM	2.5Y 7/1	NONE	FRIABLE
54.1	24"-132"	C	GRAVELLY SAND	2.5Y 7/1	NONE	LOOSE 20-25% GRAVEL

NO SOIL MOTTLES OBSERVED @ 132" TOP OF PERC 37" PERC RATE (ELEV.= 54.1) <2 MIN./INCH HOLE @ ELEV. 62.0



OBSERVATION HOLE DATA

PHILIP SPATH P.E. &
Ralph Cole P.L.S.
TESTED BY:
WITNESSED BY: PAUL A BROGNA P.E.

GRND ELEV.= 66.2
GW ELEV.=
HOLE # 304
DATE: 10-22-2003 NO MOTTING ELEV.= 55.7 CERTIFIED BY: PHILIP SPATH P.E.

ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
65.2	0"- 12"	A	LOAMY SAND	10YR 4/3		FRIABLE
63.9	12"- 28"	B	SANDY LOAM	10YR 5/8		FRIABLE
55.7	28"-126"	C	GRAVELLY SAND	2.5Y 7/1	NONE	LOOSE 20-25% GRAVEL MEDIUM SAND

NO SOIL MOTTLES OBSERVED @ 126" TOP OF PERC 31" PERC RATE (ELEV.= 55.7) <2 MIN./INCH HOLE @ ELEV. 63.6

REVISIONS:

NO.	DESCRIPTION	DATE
▲	REV. PER BOH	2/6/06

PHILLIP SPATH P.E. DATE

PREPARED BY:
ROSANO • DAVIS • SPATH ENGINEERING
9 ROCKY LANE
COHASSET, MA 02025
781-383-1234

SURVEY SERVICES PROVIDED BY:
mr SURVEYING, INC.
P.O. BOX 5104
NORWELL, MA 02061

PROJECT TITLE:
SEWAGE DISPOSAL SYSTEM DESIGN
AT
LOT 3 VIKING LANE
HINGHAM, MA
ASSESSORS' MAP 124, LOT 24

PREPARED FOR:
XERXES REALTY TRUST
293 WASHINGTON STREET
NORWELL, MA 02061

DATE: SEPT. 12, 2005

COMP./DESIGN: P.H.SPATH

CHECK: P.H.SPATH / R.H.COLE

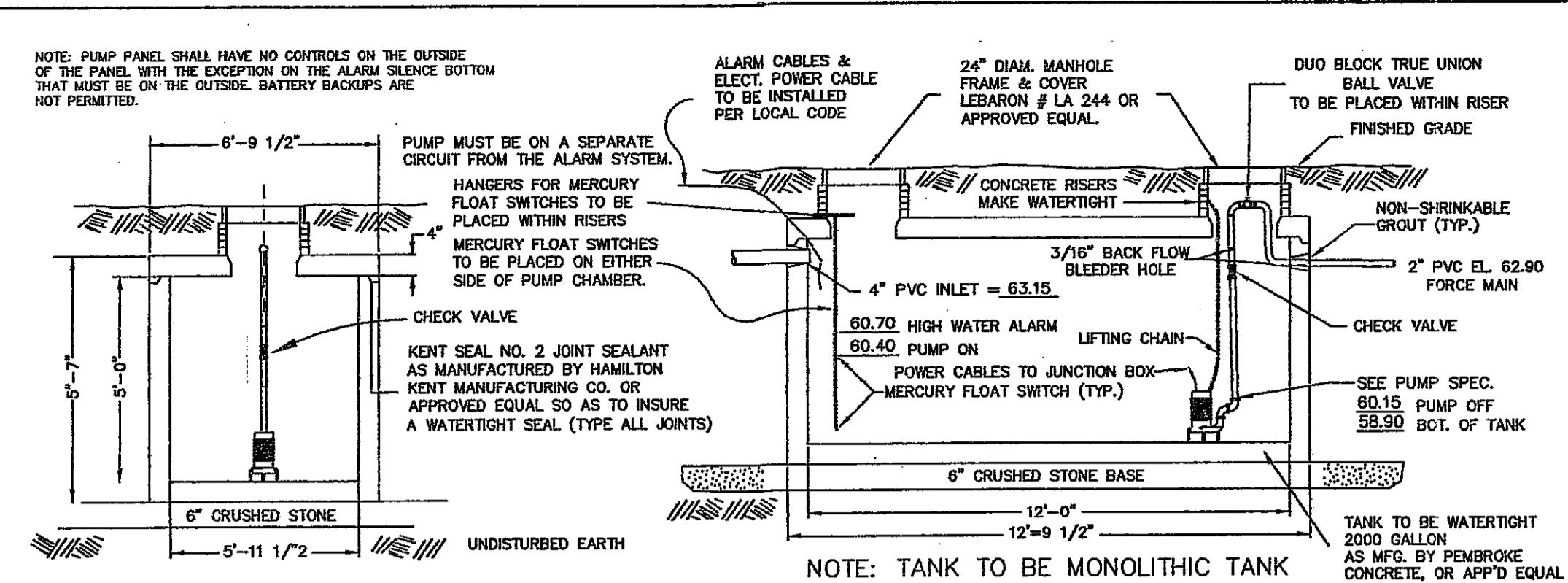
DRAWN: M.W.C.

FIELD: M.W.C./J.B.T.

RDS JOB # RDS 458

mr JOB # mr-415

2 SHEET 2 OF 2



PUMP SPECIFICATIONS

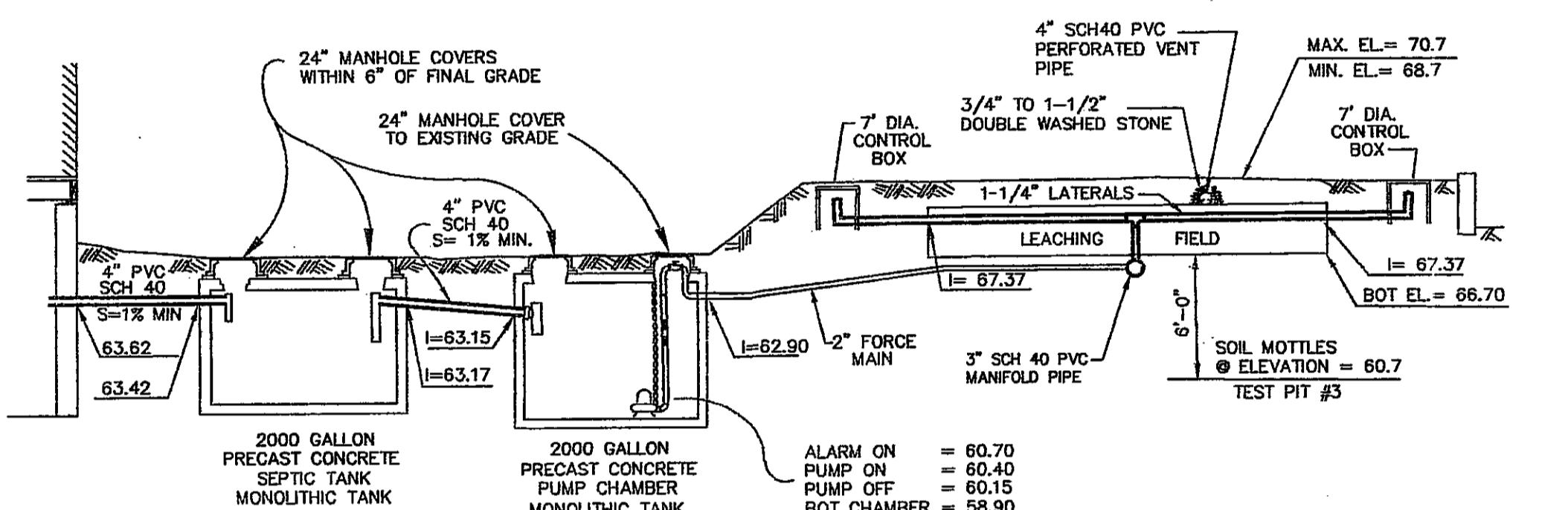
47 GPM AT 26' TDH
DISCHARGE 2"
NON CLOG IMPELLERS
SINGLE PHASE SUBMERSIBLE PUMP
MIN. DIA. SOLIDS 1 1/4"

NOTES:
CONTROL PANEL, ALARM AND SWITCHBOX TO BE LOCATED WITHIN DWELLING
ONE DAY FLOW FOR EMERGENCY STORAGE PROVIDED IN PUMP STATION ABOVE HIGH WATER ALARM ELEVATION.
INSTALL PUMP & CONTROLS PER MANUFACTURERS SPECIFICATIONS.

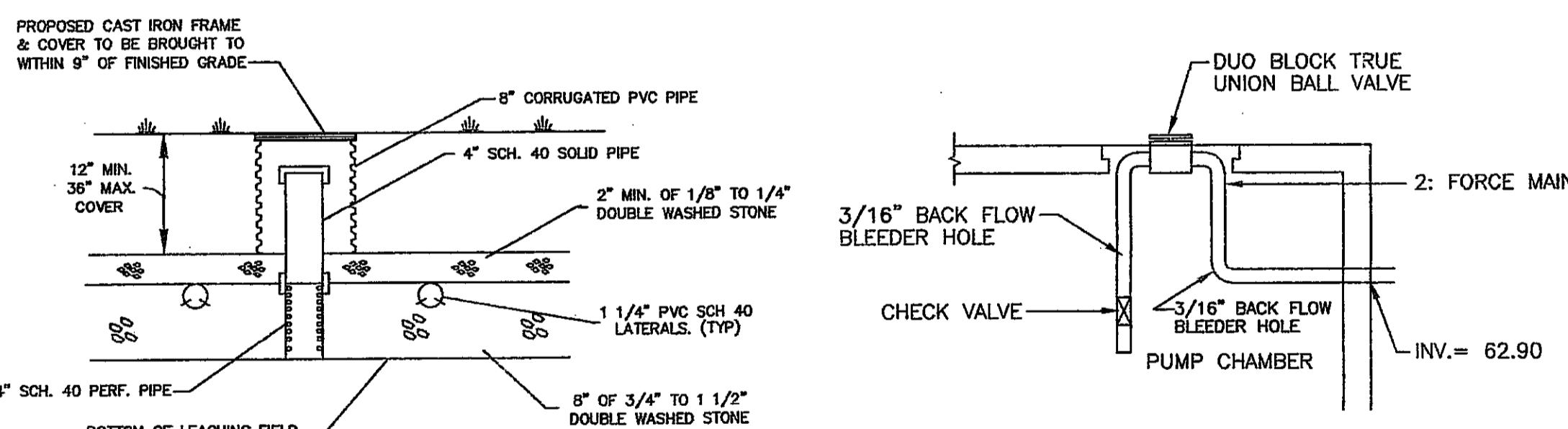
NOTE:
THE CONTRACTOR SHALL SUBMIT TO THE DESIGN ENGINEER, FOR HIS REVIEW AND APPROVAL, THE MANUFACTURERS SPECIFICATIONS FOR THE PUMP AND ACCESSORIES (MERCURY SWITCHES, VALVES, ETC.) PRIOR TO THE CONSTRUCTION OF THE SYSTEM.

SEWAGE PUMP STATION DETAIL

NOT TO SCALE

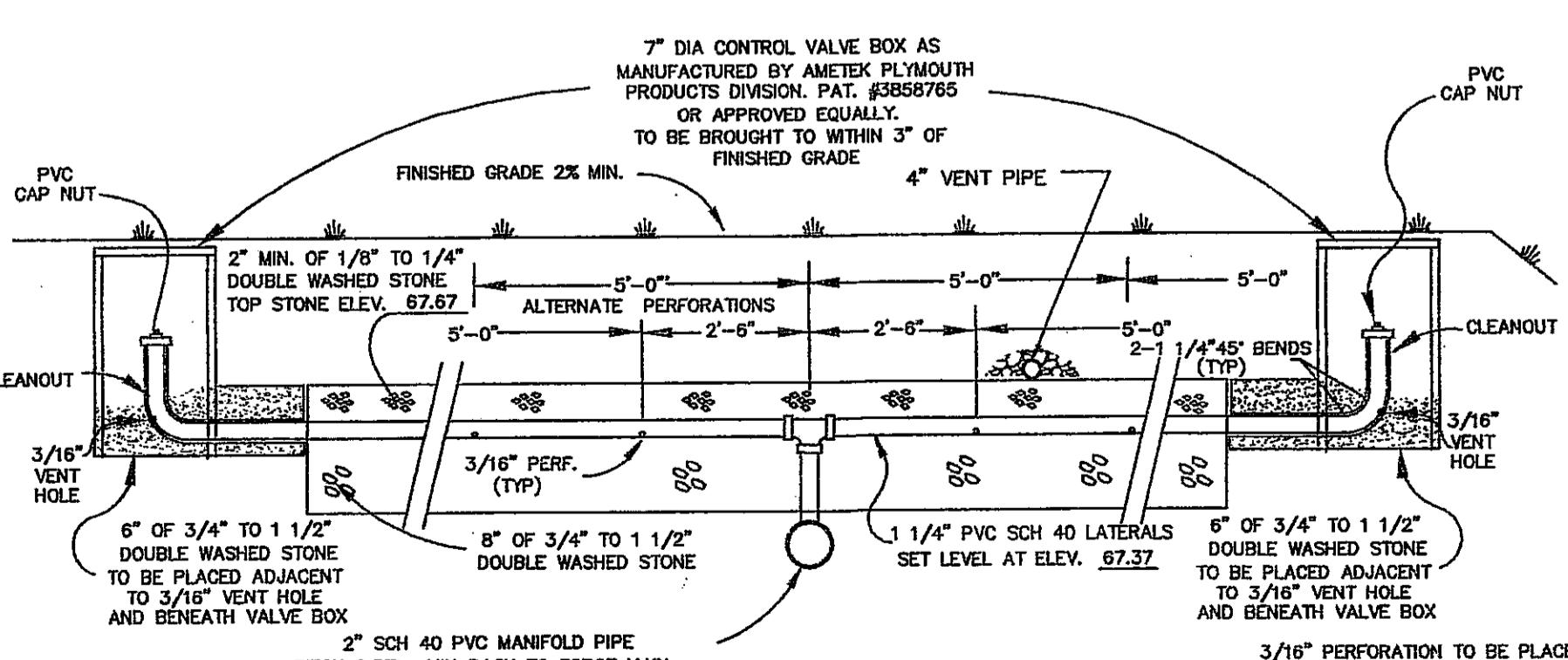


PROFILE
NOT TO SCALE



INSPECTION PORT DETAIL
NOT TO SCALE

BALL VALVE PLACEMENT DETAIL
NOT TO SCALE



SECTION A - A
NOT TO SCALE

OBSERVATION HOLE DATA

TESTED BY: RALPH COLE					
OBSERVATION HOLE # 401 GW ELEV.= - WITNESSED BY: PAUL BROGNA, P.E. SEACOAST ENGINEERING					
DATE: 10-14-2003 MOTTLED ELEV.= 68.1 CERTIFIED BY: RALPH COLE					
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING OTHER
74.3	0"- 7"	A	LOAMY SAND	10YR 3/3	FRIABLE
73.7	7"- 28"	B	LOAMY SAND	10YR 5/4	NONE FRIABLE STONES
72.0	28"-120"	C	GRAVEL	10YR 7/3	Y 75" 7.5YR 5/8 LOOSE GRAVEL MEDIUM SAND STONES
SOIL MOTTLES OBSERVED @ 75" (ELEV.= 68.1) ■ TOP OF PERC 30" HOLE @ ELEV. 71.8 PERC RATE < 2 MIN./INCH					

OBSERVATION HOLE DATA

TESTED BY: RALPH COLE					
OBSERVATION HOLE # 402 GW ELEV.= 72.3 NO GW AT ELEV.= 62.3 WITNESSED BY: PAUL BROGNA, P.E. SEACOAST ENGINEERING					
DATE: 10-14-2003 NO MOTTLED AT ELEV.= 62.3 CERTIFIED BY: RALPH COLE					
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING OTHER
72.3	0"- 7"	A	LOAMY SAND	10YR 3/3	- FRIABLE
71.7	7"- 22"	B	LOAMY SAND	10YR 5/4	NONE FRIABLE STONES
70.5	22"-120"	C	GRAVEL	10YR 7/3	NONE LOOSE GRAVEL MEDIUM SAND STONES
NO MOTTLES OR G.W. OBSERVED @ 120" (ELEV.= 62.3) ■ TOP OF PERC 25" HOLE @ ELEV. 70.2 PERC RATE < 2 MIN./INCH					

OBSERVATION HOLE DATA

TESTED BY: RALPH COLE					
OBSERVATION HOLE # 403 GW ELEV.= 70.7 NO GW AT ELEV.= 60.7 WITNESSED BY: PAUL BROGNA, P.E. SEACOAST ENGINEERING					
DATE: 10-14-2003 NO MOTTLED AT ELEV.= 60.7 CERTIFIED BY: RALPH COLE					
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING OTHER
70.7	0"- 7"	A	LOAMY SAND	10YR 3/3	- FRIABLE
70.1	7"- 22"	B	LOAMY SAND	10YR 5/4	- FRIABLE STONES
68.9	22"-120"	C	GRAVEL	10YR 7/3	- LOOSE GRAVEL MEDIUM SAND STONES
NO MOTTLES OR G.W. OBSERVED @ 120" (ELEV.= 60.7) ■ TOP OF PERC 35" HOLE @ ELEV. 67.8 PERC RATE < 2 MIN./INCH					

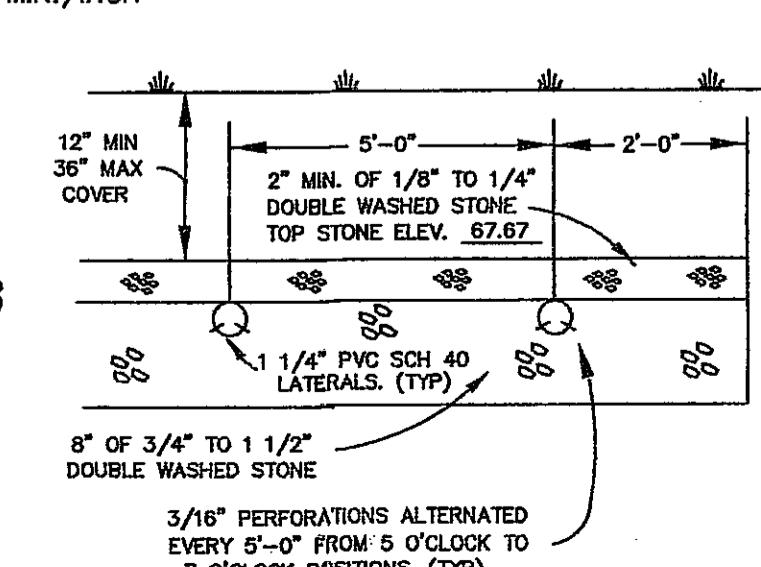
OBSERVATION HOLE DATA

TESTED BY: RALPH COLE					
OBSERVATION HOLE # 404 GW ELEV.= 72.7 NO GW AT ELEV.= 62.7 WITNESSED BY: PAUL BROGNA, P.E. SEACOAST ENGINEERING					
DATE: 10-14-2003 NO MOTTLED AT ELEV.= 62.7 CERTIFIED BY: RALPH COLE					
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING OTHER
72.7	0"- 8"	A	LOAMY SAND	10YR 3/3	- FRIABLE
72.0	8"- 26"	B	LOAMY SAND	10YR 5/4	- FRIABLE STONES
70.5	26"-120"	C	GRAVEL	10YR 7/3	NONE LOOSE GRAVEL MEDIUM SAND STONES
NO MOTTLES OBSERVED @ 120" (ELEV.= 62.7) ■ TOP OF PERC 22" HOLE @ ELEV. 70.9 PERC RATE < 2 MIN./INCH					

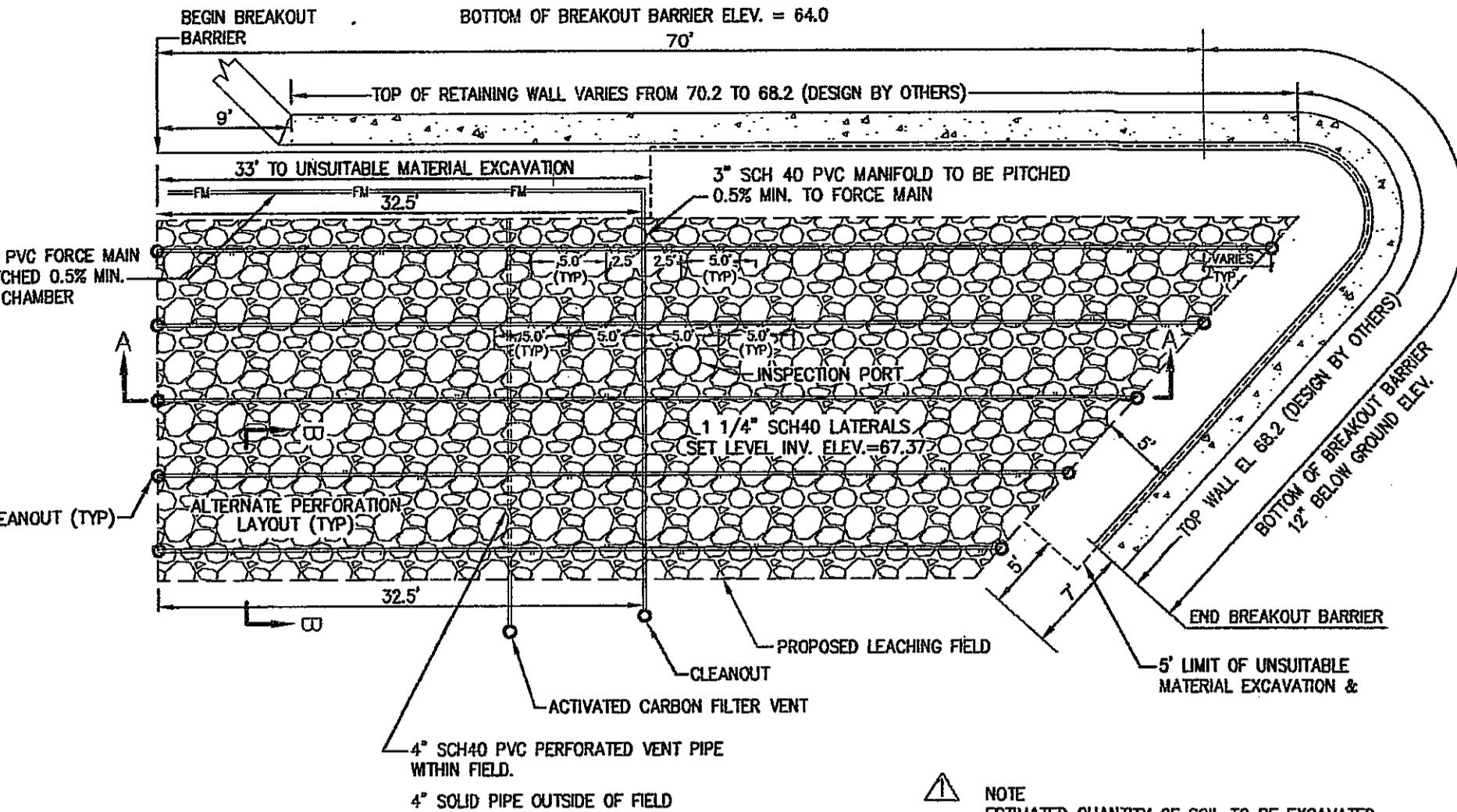
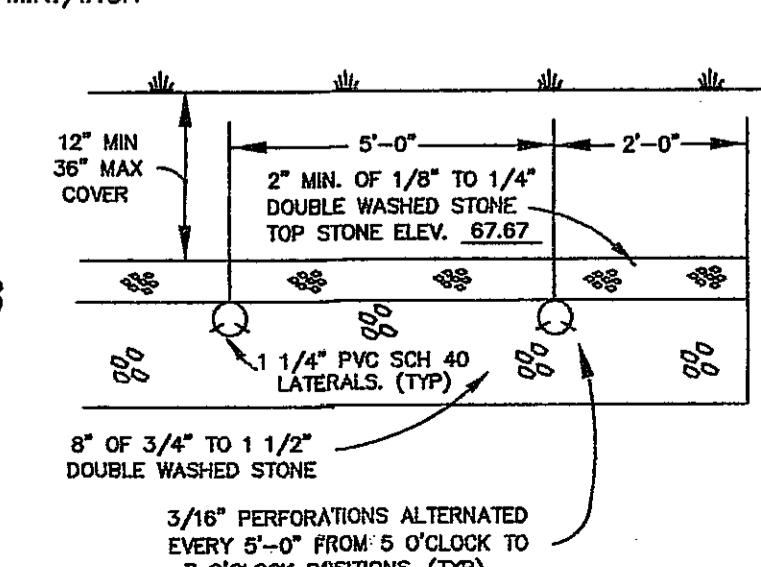
OBSERVATION HOLE DATA

TESTED BY: RALPH COLE					
OBSERVATION HOLE # 405 GW ELEV.= 65.4 NO GW AT ELEV.= 57.5 WITNESSED BY: PAUL BROGNA, P.E. SEACOAST ENGINEERING					
DATE: 10-14-2003 MOTTLED ELEV.= 57.5 CERTIFIED BY: RALPH COLE					
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING OTHER
65.4	0"- 5"	A	LOAMY SAND	10YR 3/3	- FRIABLE
64.2	5"- 18"	B	LOAMY SAND	10YR 5/4	- FRIABLE STONES
63.9	18"-112"	C	SAND	10YR 7/3	Y 95" 7.5YR 5/6 LOOSE GRAVEL
SOIL MOTTLES OBSERVED @ 95" (ELEV.= 57.5) ■ TOP OF PERC - HOLE @ ELEV. - PERC RATE - MIN./INCH					

SECTION B - B
NOT TO SCALE



SECTION C - C
NOT TO SCALE



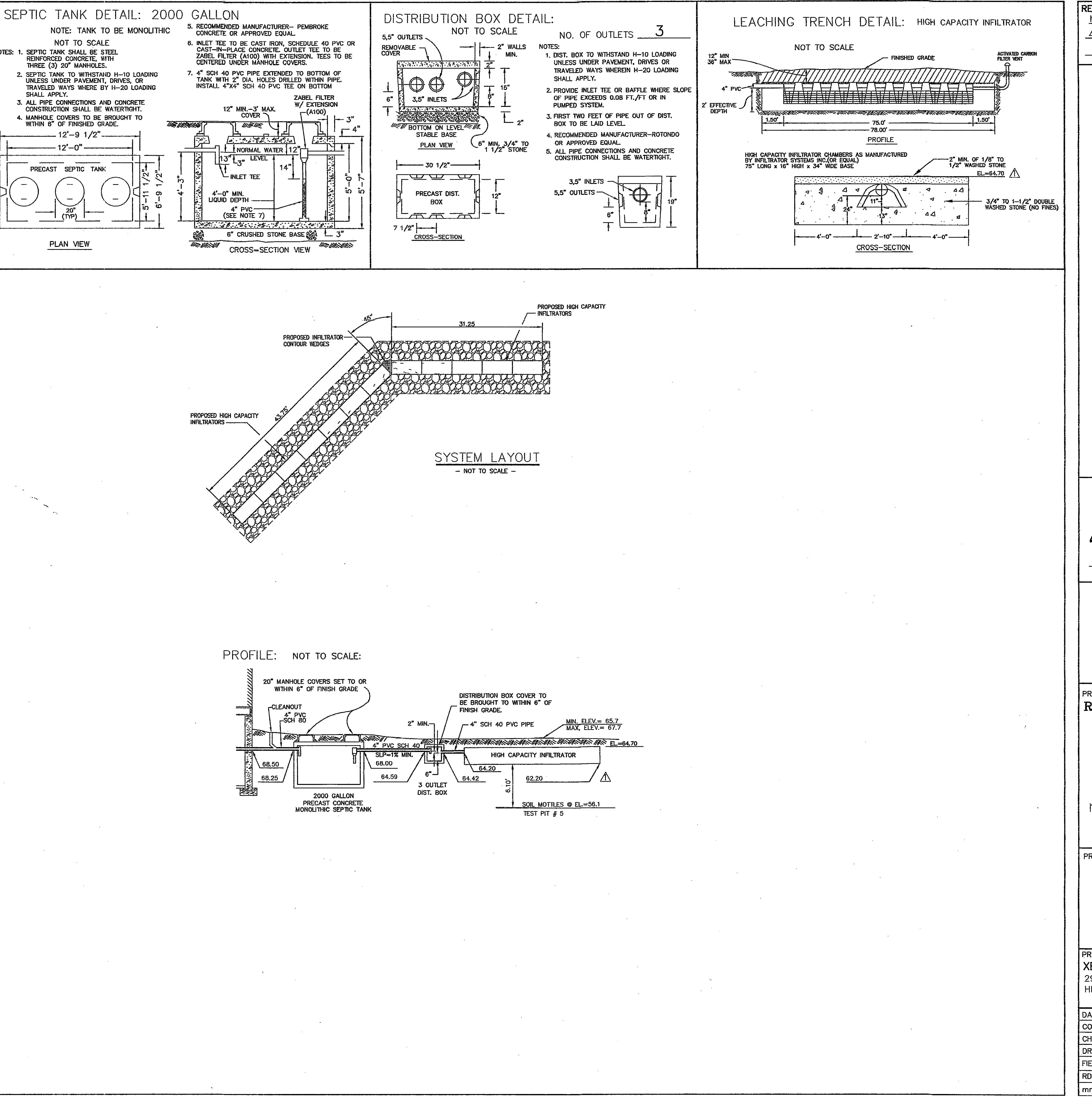
OBSERVATION HOLE DATA						
OBSERVATION HOLE # 501		GRND ELEV.= 68.6	TESTED BY: RALPH COLE			
		GW ELEV.= -	WITNESSED BY: PAUL BROGNA, P.E.	SEACOAST ENGINEERING		
		DATE: 10-14-2003	MOTTLING @ ELEV.= 59.0	CERTIFIED BY: RALPH COLE		
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
68.6	0"- 6"	A	LOAMY SAND	10YR 3/3		FRIABLE
67.9	8"- 32"	B	LOAMY SAND	10YR 5/4	NONE	FRIABLE STONES
65.9	32"- 115"	C	SAND	10YR 7/3	NONE	LOOSE GRAVEL MEDIUM SAND 10% GRAVEL
NO GROUNDWATER OBSERVED @ 115" TOP OF PERC 45° HOLE @ ELEV. 64.9 PERC RATE < 2 MIN./INCH (ELEV.= 59.0)						

OBSERVATION HOLE DATA						
OBSERVATION HOLE # 502		GRND ELEV.= 71.9	TESTED BY: RALPH COLE			
		GW ELEV.= -	WITNESSED BY: PAUL BROGNA, P.E.	SEACOAST ENGINEERING		
		DATE: 10-22-2003	MOTTLING ELEV.= 65.9	CERTIFIED BY: RALPH COLE		
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
71.9	0"- 6"	OA	LOAMY SAND	10YR 3/3		FRIABLE
71.4	6"- 24"	B	LOAMY SAND	10YR 5/8		FRIABLE STONES
69.9	24"- 72"	C1	GRAVELLY SAND	2.5Y 7/4	72" 7.5YR 5/8	LOOSE GRAVEL 10% - 15% GRAVEL
65.9	72"- 138"	C2	SANDY LOAM	10YR 7/3		HARD SILTY SAND
SOIL MOTTLES OBSERVED @ 72" TOP OF PERC - HOLE @ ELEV. - PERC RATE < 2 MIN./INCH (ELEV.= 65.9)						

OBSERVATION HOLE DATA						
OBSERVATION HOLE # 503		GRND ELEV.= 70.0	TESTED BY: RALPH COLE			
		GW ELEV.= -	WITNESSED BY: PAUL BROGNA, P.E.	SEACOAST ENGINEERING		
		DATE: 10-22-2003	MOTTLING ELEV.= 57.5	CERTIFIED BY: RALPH COLE		
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
70.0	0"- 6"	OA	LOAMY SAND	10YR 4/1		FRIABLE
69.5	6"- 150"	C1	GRAVELLY SAND	2.5Y 7/1	NONE	LOOSE 15% - 20% GRAVEL
57.5	150"- "	C2	SANDY LOAM	10YR 7/3	Y 150" 7.5YR 5/8	HARD
SOIL MOTTLES OBSERVED @ 150" TOP OF PERC 36° HOLE @ ELEV. 67.0 PERC RATE < 2 MIN./INCH (ELEV.= 57.5)						

OBSERVATION HOLE DATA						
OBSERVATION HOLE # 504		GRND ELEV.= 67.5	TESTED BY: RALPH COLE			
		GW ELEV.= -	WITNESSED BY: PAUL BROGNA, P.E.	SEACOAST ENGINEERING		
		DATE: 10-22-2003	MOTTLING ELEV.= 55.5	CERTIFIED BY: RALPH COLE		
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
67.5	0"- 24"	A	SANDY LOAM	10YR 4/3		FRIABLE
65.5	24"- 40"	B	LOAMY SAND	10YR 6/4		FRIABLE STONES
64.2	40"- 144"	C1	GRAVELLY SAND	2.5Y 7/1		LOOSE GRAVEL MEDIUM SAND STONES
55.5	144"- "	C2	SANDY LOAM	10YR 7/3	Y 144" 7.5YR 5/8	HARD
SOIL MOTTLES OBSERVED @ 144" TOP OF PERC 36° HOLE @ ELEV. 64.5 PERC RATE < 2 MIN./INCH (ELEV.= 55.5)						

OBSERVATION HOLE DATA						
OBSERVATION HOLE # 505		GRND ELEV.= 67.8	TESTED BY: RALPH COLE			
		GW ELEV.= -	WITNESSED BY: PAUL BROGNA, P.E.	SEACOAST ENGINEERING		
		DATE: 10-22-2003	MOTTLING ELEV.= 56.1	CERTIFIED BY: RALPH COLE		
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
67.8	0"- 41"	FILL				
64.4	41"- 140"	C1	GRAVELLY SAND	2.5Y 7/1	NONE	LOOSE 10% - 15% GRAVEL
55.1	140"	C2	SANDY LOAM	10YR 7/2	Y 140" 7.5YR 5/8	HARD
SOIL MOTTLES OBSERVED @ 140" TOP OF PERC 41° HOLE @ ELEV. 64.4 PERC RATE < 2 MIN./INCH (ELEV.= 56.1)						



OBSERVATION HOLE DATA

OBSERVATION GRND ELEV.= 77.1 TESTED BY: RALPH COLE
 HOLE # 6A-1 GW ELEV.= - WITNESSED BY: PAUL BROGNA, P.E.
 SEACOAST ENGINEERING
 DATE: 11-3-04 MOTTING ELEV.= - CERTIFIED BY: RALPH COLE

ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
77.1	0"- 12"	O	LEAVES PINE NEEDLES	10YR 3/3		LEAVES, PINE NEEDLES
76.1	12"- 24"	A	GRAVELLY SAND	10YR 3/3		FRIABLE ROOTS
75.1	24"- 36"	B	SANDY LOAM	10YR 5/4	NONE	FRIABLE ROOTS
74.1	36"-120"	C	GRAVEL	2.5Y 7/3	NONE	LOOSE MEDIUM SAND 25% STONES 10% COBBLES 10%

SOIL MOTTLES OBSERVED @ 120" TOP OF PERC 39" PERC RATE
 (ELEV.= 67.1) HOLE @ ELEV. 73.8 < 2 MIN./INCH

OBSERVATION HOLE DATA

OBSERVATION GRND ELEV.= 68.6 TESTED BY: RALPH COLE
 HOLE # 6A-2 GW ELEV.= - WITNESSED BY: PAUL BROGNA, P.E.
 SEACOAST ENGINEERING
 DATE: 11-3-04 MOTTING ELEV.= - CERTIFIED BY: RALPH COLE

ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
68.6	0"- 12"	O				LEAVES, PINE NEEDLES
67.6	12"- 24"	A	LOAMY SAND	10YR 3/3		FRIABLE ROOTS
66.6	24"- 36"	B	LOAMY SAND	10YR 5/4		FRIABLE ROOTS
65.6	36"-120"	C	GRAVEL	2.5Y 7/3		LOOSE MEDIUM SAND 25% STONES 10% COBBLES 10%

SOIL MOTTLES OBSERVED @ 120" TOP OF PERC 80" PERC RATE
 (ELEV.= 58.6) HOLE @ ELEV. 61.9 < 2 MIN./INCH

OBSERVATION HOLE DATA

OBSERVATION GRND ELEV.= 70.0 TESTED BY: RALPH COLE
 HOLE # 6A-3 GW ELEV.= - WITNESSED BY: PAUL BROGNA, P.E.
 SEACOAST ENGINEERING
 DATE: 11-3-04 MOTTING ELEV.= - CERTIFIED BY: RALPH COLE

ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
7.0	EAST 0"- 10" WEST 0"- 10"	A	LOAMY SAND	10YR 3/3		FRIABLE ROOTS
69.2	10"- 47" 10"- 52"	B	LOAMY SAND	10YR 5/4		FRIABLE
69.6	47"-102" 52" LEDGE	C	GRAVEL	2.5Y 7/3		LOOSE MEDIUM SAND 25% STONES 10% COBBLES 10%

SOIL MOTTLES OBSERVED @ 102" TOP OF PERC 57" PERC RATE
 (ELEV.= 61.5) HOLE @ ELEV. 65.2 < 2 MIN./INCH

OBSERVATION HOLE DATA

OBSERVATION GRND ELEV.= 61.1 TESTED BY: RALPH COLE
 HOLE # 6A-4 GW ELEV.= - WITNESSED BY: PAUL BROGNA, P.E.
 SEACOAST ENGINEERING
 DATE: 11-3-04 MOTTING ELEV.= - CERTIFIED BY: RALPH COLE

ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
61.2	0"- 12"	A	LOAMY SAND	10YR 3/3		FRIABLE
60.1	12"- 52"	B	LOAMY SAND	10YR 5/4		FRIABLE
57.8	52"- 101"	C	GRAVEL	2.5Y 7/3		LOOSE MEDIUM SAND 25% STONES 10% COBBLES 10%

SOIL MOTTLES OBSERVED @ 101" TOP OF PERC 52" PERC RATE
 (ELEV.= 52.7) HOLE @ ELEV. - < 2 MIN./INCH

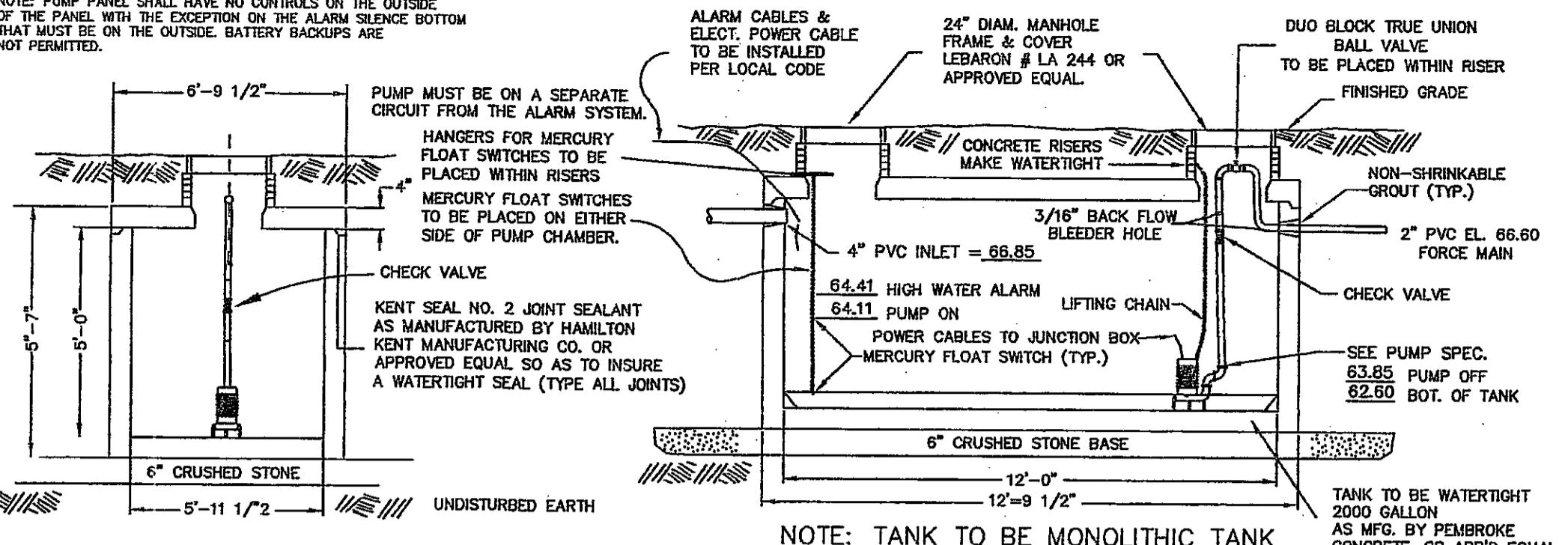
OBSERVATION HOLE DATA

OBSERVATION GRND ELEV.= 67.5 TESTED BY: RALPH COLE
 HOLE # 504 GW ELEV.= - WITNESSED BY: PAUL BROGNA, P.E.
 SEACOAST ENGINEERING
 DATE: 10-22-2003 MOTTING ELEV.= 55.5 CERTIFIED BY: RALPH COLE

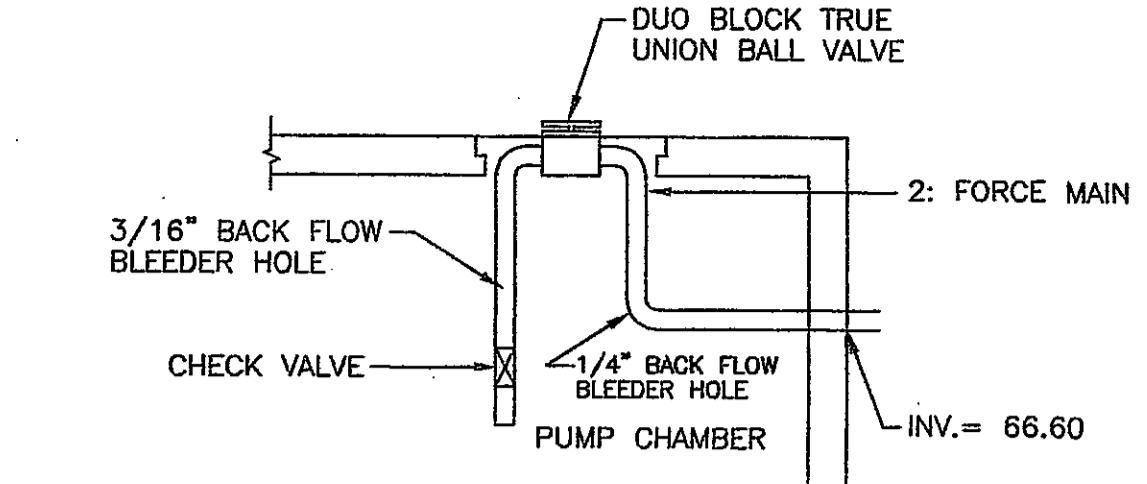
ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
67.5	0"- 24"	A	SANDY LOAM	10YR 4/3		FRIABLE
65.5	24"- 40"	B	LOAMY SAND	10YR 6/4		FRIABLE STONES
64.2	40"-144"	C1	GRAVELLY SAND	2.5Y 7/1		LOOSE GRAVEL MEDIUM SAND STONES
55.5	144"-	C2	SANDY LOAM	10YR 7/2	Y 144" 7.5YR 5/8	HARD

SOIL MOTTLES OBSERVED @ 144" TOP OF PERC 36" PERC RATE
 (ELEV.= 55.5) HOLE @ ELEV. 64.5 < 2 MIN./INCH

NOTE: PUMP PANEL SHALL HAVE NO CONTROLS ON THE OUTSIDE OF THE PANEL, WITH THE EXCEPTION OF THE ALARM SILENCE BOTTOM THAT MUST BE ON THE OUTSIDE. BATTERY BACKUPS ARE NOT PERMITTED.



NOTE: TANK TO BE MONOLITHIC TANK



BALL VALVE PLACEMENT DETAIL
NOT TO SCALE

PUMP SPECIFICATIONS

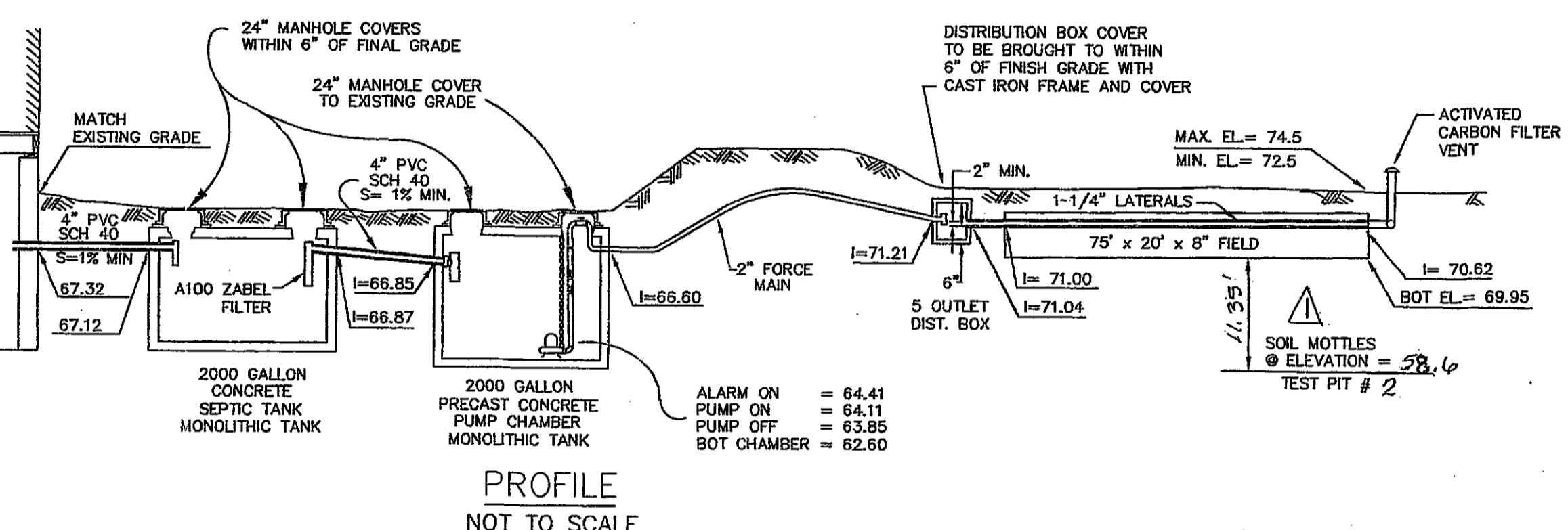
30 GPM AT 30 TDH
 DISCHARGE 1.5"
 NON CLOG IMPELLERS
 SINGLE PHASE SUBMERSIBLE PUMP
 MIN. DIA. SOLIDS 1 1/4"

NOTES:
 CONTROL PANEL, ALARM AND SWITCHBOX TO BE LOCATED WITHIN DWELLING
 ONE DAY FLOW FOR EMERGENCY STORAGE PROVIDED IN PUMP STATION ABOVE HIGH WATER ALARM ELEVATION.
 INSTALL PUMP & CONTROLS PER MANUFACTURERS SPECIFICATIONS.

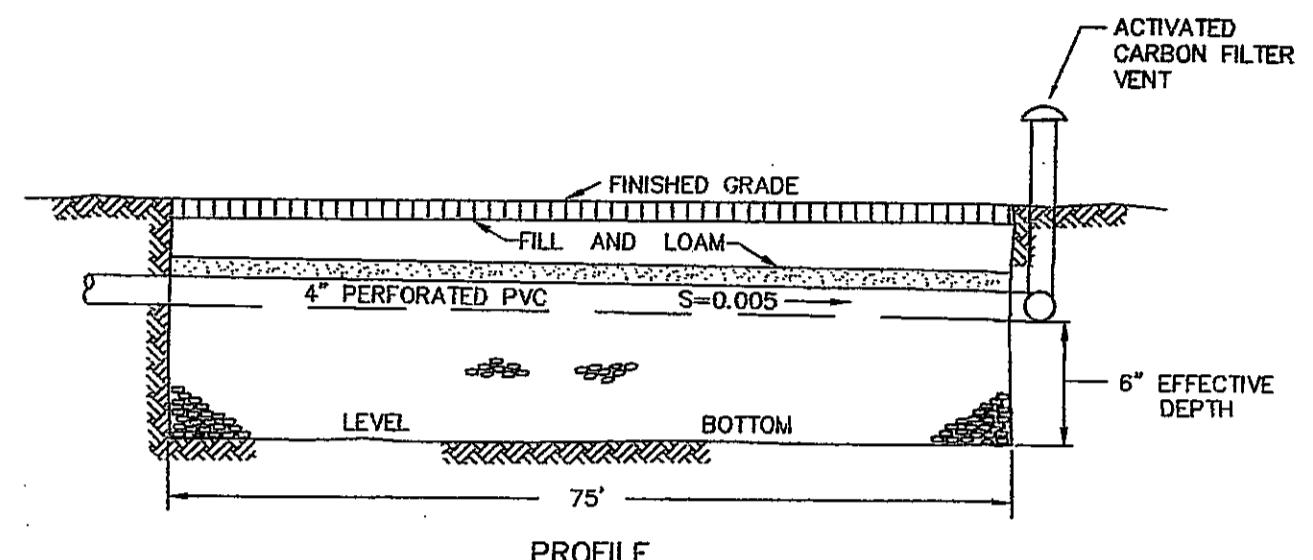
NOTE:
 THE CONTRACTOR SHALL SUBMIT TO THE DESIGN ENGINEER, HIS REVIEW AND APPROVAL THE MANUFACTURERS SPECIFICATIONS FOR THE PUMP AND ACCESSORIES (MERCURY SWITCHES, VALVES, ETC.) PRIOR TO THE CONSTRUCTION OF THE SYSTEM.

SEWAGE PUMP STATION DETAIL

NOT TO SCALE



PROFILE
NOT TO SCALE

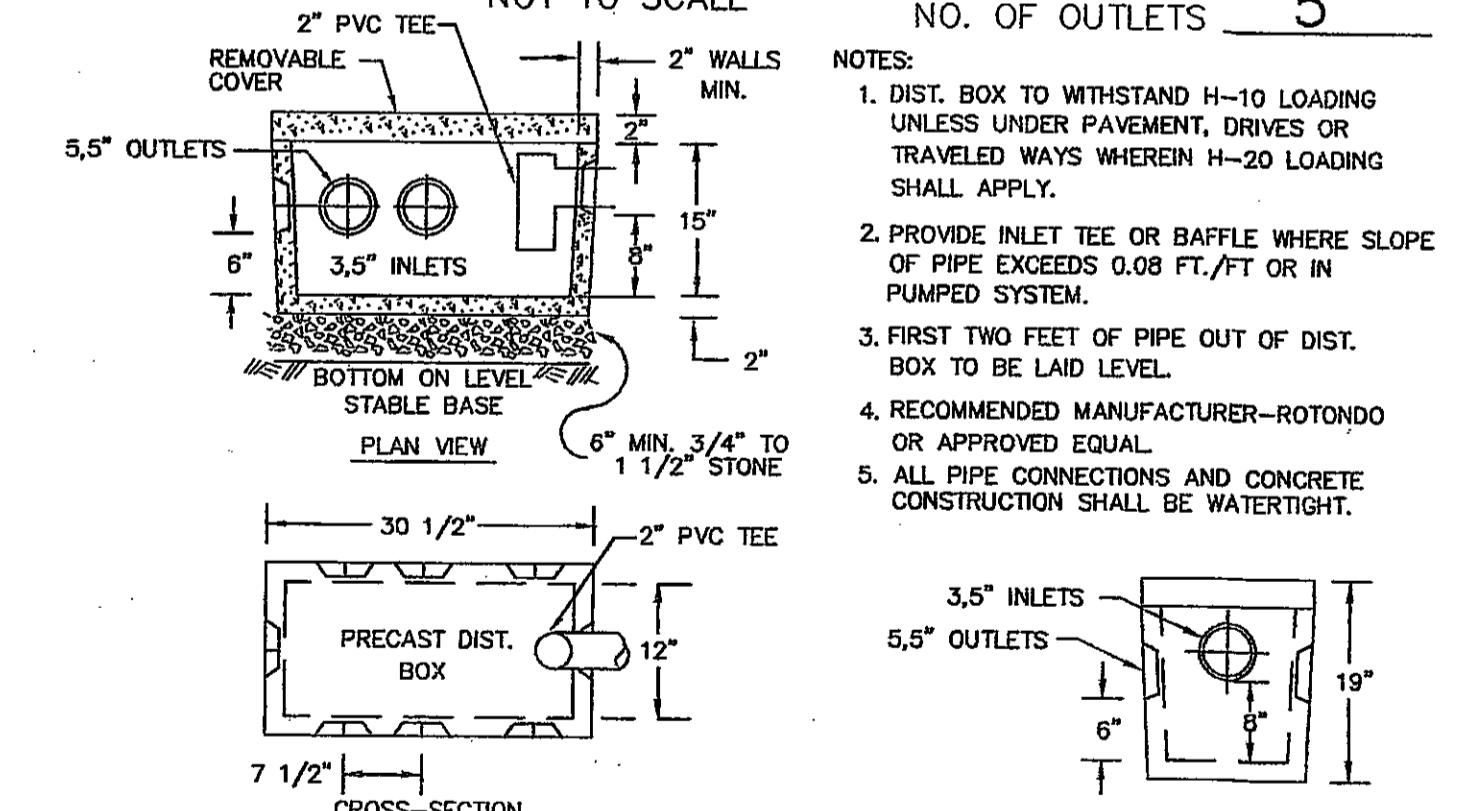


LEACHING FIELD

NOT TO SCALE

DISTRIBUTION BOX DETAIL:

NOT TO SCALE NO. OF OUTLETS 5



NOTES:
 1. DIST. BOX TO WITHSTAND H-10 LOADING UNLESS UNDER PAVEMENT, DRIVES OR TRAVELED WAYS WHEREIN H-20 LOADING SHALL APPLY.
 2. PROVIDE INLET TEE OR BAFFLE WHERE SLOPE OF PIPE EXCEEDS 0.08 FT./FT OR IN PUMPED SYSTEM.
 3. FIRST TWO FEET OF PIPE OUT OF DIST. BOX TO BE LAID LEVEL.
 4. RECOMMENDED MANUFACTURER-ROTONDO OR APPROVED EQUAL.
 5. ALL PIPE CONNECTIONS AND CONCRETE CONSTRUCTION SHALL BE WATERTIGHT.

REVISIONS:	DESCRIPTION	DATE
REV. PER 150 ft CONSUL.	2-15-06	

PREPARED BY:
ROSANO • DAVIS • SPATH
ENGINEERING
 9 ROCKY LANE
 COHASSET, MA 02025
 781-383-1234
 SURVEY SERVICES PROVIDED BY:
mr SURVEYING, INC.
 P.O. BOX 5104
 NORWELL, MA 02061

PROJECT TITLE:
SEWAGE DISPOSAL SYSTEM DESIGN
 AT
 LOT 6 VIKING LANE
 HINGHAM, MA
 ASSESSORS' MAP 124, LOT 24
 PREPARED FOR:
XERXES REALTY TRUST
 2932 WASHINGTON STREET
 NORWELL, MA 02061
 DATE: JUNE 29, 2005
 COMP./DESIGN: P.H. SPATH
 CHECK: P.H. SPATH / R.H. COLE
 DRAWN: M.W.C.
 FIELD: M.W.C./J.B.T. VIKING LOT 6
 RDS JOB # RDS 458 SHEET
 mr JOB # mr-415 2 OF 2

OBSERVATION HOLE DATA

OBSERVATION GRND ELEV.= 67.8 TESTED BY: RALPH COLE
 HOLE # 505 GW ELEV.= - WITNESSED BY: PAUL BROGNA, P.E.
 SEACOAST ENGINEERING
 DATE: 10-22-2003 MOTTING ELEV.= 56.1 CERTIFIED BY: RALPH COLE

ELEV.	SURFACE DEPTH	SOIL HORIZON	SOIL TEXTURE	SOIL COLOR	SOIL MOTTLING	OTHER
67.8	0"- 4"	FILL				
64.4	41"-140"	C1	GRAVELLY SAND	2.5Y 7/1	NONE	10% - 15% GRAVEL
55.1	140"	C2	SANDY LOAM	10YR 7/2	Y 140" 7.5YR 5/8	HARD

SOIL MOTTLES OBSERVED @ 140" TOP OF PERC 41" PERC RATE
 (ELEV.= 56.1) HOLE @ ELEV. 64.4 < 2 MIN./INCH